Service and
Repair Instructions

VENTI*motion*

BiLevel-ST Home Ventilation Unit
WM 24800

VENTI*logic*

BiLevel-ST Home Ventilation Unit
WM 27000

WEINMANN

Contents

Introduction 3

1. Overview 4

2. Description of device 10
2.1 Intended use for VENTI*motion*/VENTI*logic* . 10
2.2 Functional description 10
– Provision of therapy pressure
– Therapy modes
– Other functions

3. Hygiene treatment 11
3.1 Cleaning and disinfecting in use 11
3.2 Cleaning and disinfecting on repair 11
3.3 Cleaning and disinfecting for a patient change 11
3.4 Clean and disinfect humidifier during use . . 12
3.5 Clean and disinfect humidifier on patient change 12
3.6 Clean and disinfect the VENTI*power* 12
3.7 Clean and disinfect the VENTI-O_2 12

4. Test the device 13
4.1 General 13
4.2 Test equipment 13
4.3 Preparation for testing 13
– Check power supply cable
– Check housing
– Connection to VENTI*support*
4.4 Enter device data 14
4.5 Test temperature calibration and calibration status 14
4.6 Test battery voltage 15
4.7 Test interface with the VENTI*click* 15
4.8 Check target pressure values 5, 20 and 35 hPa 15
4.9 Test flow measurement 16
4.10 Test leaktightness 17
4.11 Test clock function 17
4.12 Test the interface with the VENTI-O_2 18
4.13 Test interface with the VENTI*power* 18
4.14 Test noise 19
4.15 Test all keys, the rotary knob and 115 V mode 19
4.16 Test display incl. backlighting and contrast, the LEDs and the alarm 20
4.17 Test equipment and accessories (system components) 21
– Check function of humidifier
– Function check VENTI-O_2
4.18 Once tests are complete 22

5. Maintenance 23
5.1 Intervals 23
5.2 Filter change 24
– Coarse dust filter
– Fine filter
– Reset filter change indicator
– Bacteria filter
5.3 Device cleaning 25
5.4 Reset maintenance symbol 26
5.5 Check the maintenance sticker 27
5.6 Disposal 27

6. Malfunctions and rectification 28
6.1 General faults 28
6.2 Internal faults 29
– Fault output in clear text
– Coded error messages

7. Repairguide for VENTI*motion*/VENTI*logic* 31
7.1 General 31
7.2 Open device 31
7.3 Close the device 32
7.4 Replace mains supply unit 33
7.5 Replace power board 34
7.6 Replace box and filter holder 35
7.7 Replace fan 37
7.8 Replace control board/display 39
7.9 Replace battery on control board 42
7.10 Dismantle device outlet 42
7.11 Replace encoder (dial) 44
7.12 Replace fascia film 45
7.13 Replace bottom part of housing 46
7.14 Replace top part of housing 47

8. Spare parts 48
8.1 List of spare parts for VENTI*motion*/VENTI*logic* 48
8.2 Spare parts required for servicing 51

9. Tools, test equipment and disinfectants 53
9.1 Tools 53
9.2 Test equipment and fixtures 53
9.3 Disinfectants 54

10. Technical data 55
10.1 Diagram of pneumatic system 57
10.2 Safety distances 57

11. Technical amendments 58

12. Protocols 59
12.1 Repair and service protocol 59
12.2 Test protocol 60

Introduction

The objective of this service and repair guide is to familiarize you, an **expert, trained specialist,** with the VENTI*motion* and VENTI*logic* in terms of function, technology, servicing and repair. This will enable you to train your customers properly, eliminate faults yourself, perform the function checks specified by the operating instructions and carry out any repairs in accordance with this service and repair guide.

In the event of a claim under warranty, return the devices to Weinmann.

To allow warranty or goodwill applications to be processed, please also send the final customer's proof of purchase (invoice).

Repairs may be performed only by Weinmann or by expert, trained specialists.

You are responsible for repairs carried out yourself and for their warranty!

Use **only original Weinmann spare parts** for repair.

Remember:
your customer trusts you and is relying on your ability to do the job, just as you rely on Weinmann.

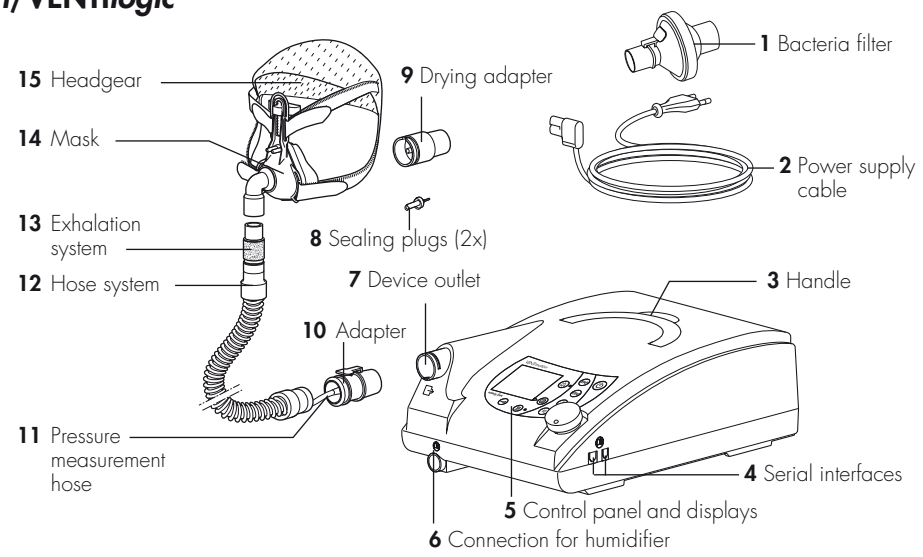
Note

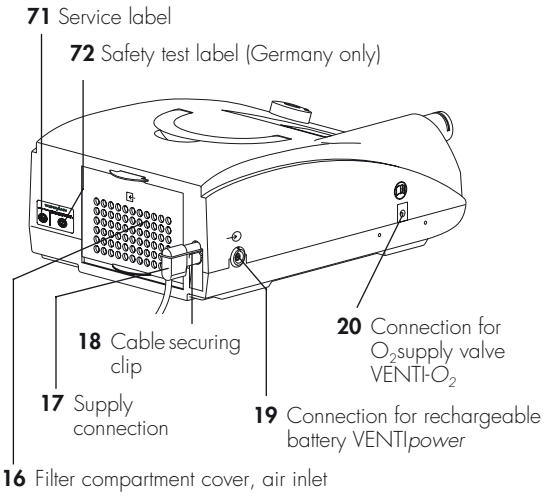
The following information can be found in the operating instructions for the devices:

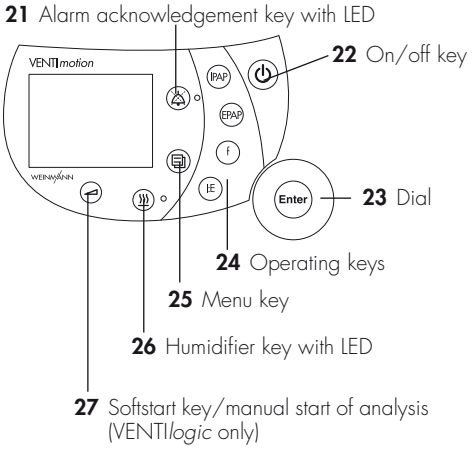
- safety rules
- setting up device
- operation
- cleaning and disinfecting in use
- warranty

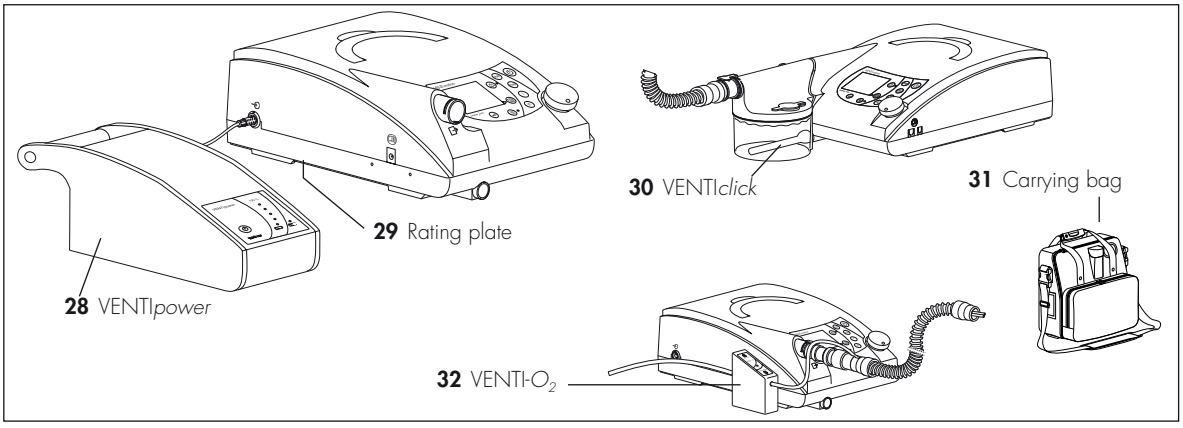
1. Overview

VENTI*motion*/VENTI*logic*




71 Service label
72 Safety test label (Germany only)
18 Cable securing clip
20 Connection for O_2 supply valve VENTI-O_2
17 Supply connection
19 Connection for rechargeable battery VENTI*power*
16 Filter compartment cover, air inlet





1 Bacteria filter

To protect the device from contamination, especially if the device is being used by several patients.

2 Power supply cable

For connecting the therapy device to the mains power supply.

3 Handle

For transporting the device.

4 Serial interfaces

For connecting to devices, for display, evaluation.

5 Control panel and displays

For controlling and monitoring the therapy device and the connected accessories.

6 Connection for humidifier

For connecting the VENTI*click* humidifier available as an accessory.

7 Device outlet

Respiratory air flows out from here to the patient via the hose system and nasal mask.

8 Sealing plugs (2x)

For sealing the pressure measurement hose during cleaning.

9 Drying adapter

Required to dry the hose system with the therapy device and for function check.

10 Adapter

For connecting the hose system to the device outlet.

11 Pressure measurement hose

For measuring the pressure prevailing in the mask.

12 Hose system

The air flows to the mask through the hose system. The hose system consists of creased hose, pressure measurement hose and adapter.

13 Exhalation system

Carbondioxide-enriched expired air escapes here during therapy.

14 Mask

Respiratory air at the necessary therapy pressure is administered to the patient via the mask.

15 Headgear

For correct and secure positioning of the mask.

16 Filter compartment cover, air inlet

For covering and securely positioning the coarse and fine dust filter.

17 Supply connection

This is where the power supply cable is attached to the device.

18 Cable securing clip

Prevents the device being disconnected from the power supply inadvertently.

19 Connection for rechargeable battery VENTIpower

For connecting the VENTI*power* mobile power supply available as an accessory.

20 Connection for O_2supply valve VENTI-O_2

For connecting the VENTI-O_2 oxygen supply valve available as an accessory.

21 Alarm acknowledgement key with LED

The alarm acknowledgement key is for temporarily muting alarms. The LED provides a visual display of alarms.

22 On/off key

For switching the therapy device on and off.

23 Dial

Central control of the therapy device, for navigating in the menu.

24 Operating keys

For rapid setting by a physician, disabled in patient mode.

25 Menu key

For switching to and fro between the standard display and the menu.

26 Humidifier key with LED

For switching the humidifier on and off or for setting humidifier stage. Six levels are available. The LED indicates whether the humidifier is activated.

27 Softstart key/manual start of analysis (VENTIlogic only)

For activating Softstart and for setting Softstart time up to the maximum Softstart time set in the menu.

In TA mode (VENTI*logic* only), this key is used to start an analysis phase manually.

28 VENTIpower

Available as an accessory to provide a mobile power source for the therapy device.

29 Rating plate

Provides information about the device, such as serial number and year of manufacture.

30 VENTIclick

Available as an accessory for humidifying and heating respiratory air.

31 Carrying bag

For transporting the therapy device.

32 VENTI-O_2

Available as an accessory, for introducing oxygen to the mask.

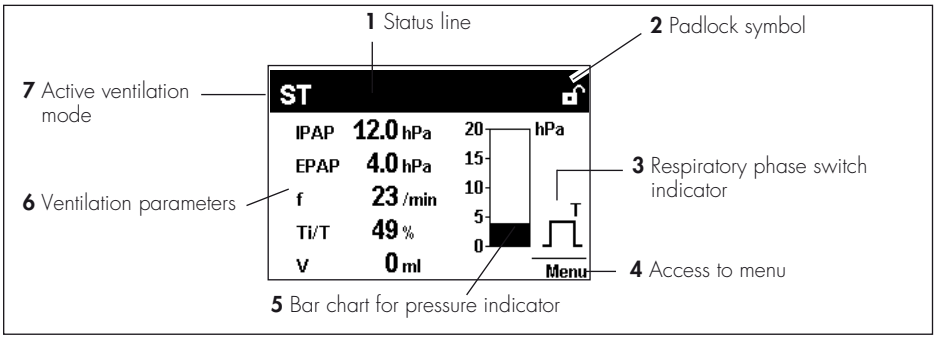
71 Service label

Indicates when maintenance is next due.

72 Safety test label (in Germany only)

Indicates when the next safety check in accordance with §6 of the German law relating to owners of medical devices [Medizinprodukte-Betreiberverordnung] is due.

Standard display during therapy



1 Status line

This is where information about the status of the device is displayed, such as filter change or maintenance due.

2 Padlock symbol

Indicates whether physician functions are enabled (padlock open) or disabled (padlock closed). The padlock is not displayed in patient mode.

3 Respiratory phase switch indicator

Indicates whether the current respiratory phase switch is spontaneous or mandatory (spontaneous: S, mandatory: T); the indicator switches from left (inspiration) to right (exhalation) depending on respiratory phase; spontaneous exspiration is shown here.

4 Access to menu

The key next to this menu item is used to switch to and fro between the menu and the standard display.

5 Bar chart for pressure indicator

For graphical display of pressure.

6 Ventilation parameters

The relevant current ventilation parameters are displayed depending on the active mode.

7 Active ventilation mode

The active ventilation mode is displayed at this point in the status line.

Symbols used in the display

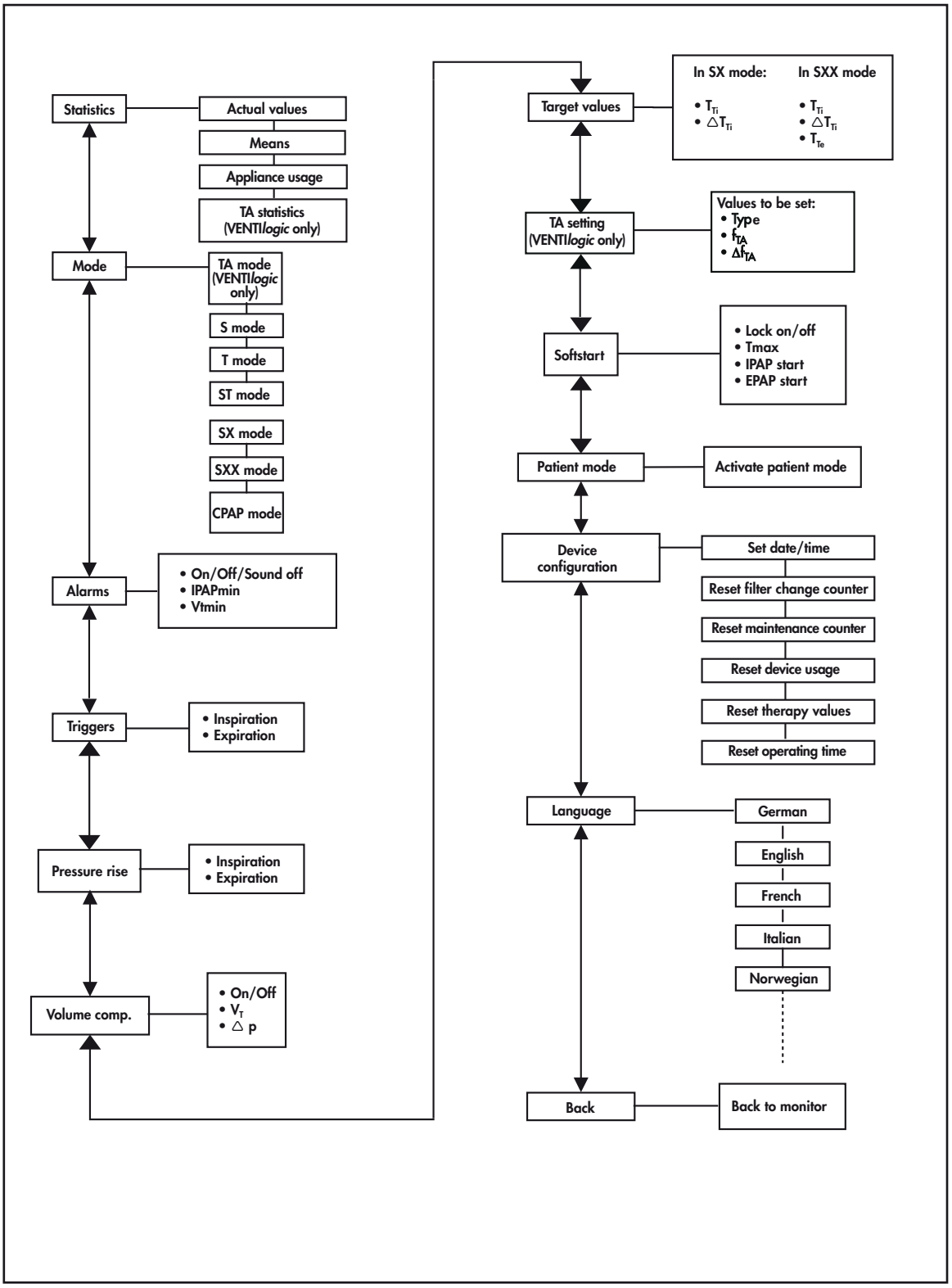
Symbol	Significance
Status line:	
	Softstart active, remaining time faded in
	Filter change required
	Maintenance required
	Acoustic signal for the IPAPmin and $V_T$min alarms mute
	Alarm for IPAPmin and $V_T$min alarms deactivated
	Physician functions enabled
	Physician functions disabled
	Fan off (with VENTI*motion*, only available from software version 6.0)
Main window	
	Low-priority alarm triggered
	Medium-priority alarm triggered

Abbreviations used in the display

Symbol	Significance
Status line:	
TA	TA mode active (VENTI*logic* only)
S	S mode active
ST	ST mode active
T	T mode active
SX	SX mode active
SXX	SXX mode active
CPAP	CPAP mode active
+V	Volume compensation activated (follows mode: e.g. **SXX**$^{+V}$)
A^{A}	Device in TA mode, automatic analysis phase in progress (VENTI*logic* only)
A^{M}	Device in TA mode, manual analysis phase in progress (VENTI*logic* only)
Main window (monitor)	
IPAP	Inspiration pressure
EPAP	Expiration pressure
hPa	Pressure shown in hectopascal; 1.01973 hPa correspond to 1 cm H_2O

Symbol	Significance
f	Respiratory frequency
S	Spontaneously-triggered respiratory phase switch
T	Compulsorily-triggered respiratory phase switch
Main window ("Statistics" menu item):	
Δp	Maximum rise in pressure due to volume compensation
V	Volume
MV	Per minute volume
Leak	System leak (mask, exspiration system, hose system, device)
f	Respiratory frequency
Ti/T	Proportion of inspiration time in a respiratory cycle
$\overline{\textbf{Sins}}$	Proportion of spontaneous inspiration (only when mean values displayed)
$\overline{\textbf{Sexs}}$	Proportion of spontaneous exspiration (only when mean values displayed)

Menu structure in Physician mode



2. Description of device

2.1 Intended use for VENTI*motion*/VENTI*logic*

VENTI*motion* and VENTI*logic* are home ventilation devices for the non-invasive, non-life support ventilation of adult patients with respiratory insufficiency in whom there is evidence of autonomous respiratory drive. This corresponds to the following clinical pictures:

- restrictive and obstructive ventilation disorders like paresis of the diaphragm, OSAS, COPD
- disorders of the respiratory mechanism like scoliosis, deformity of the thorax
- neurological, muscular and neuromuscular disorders
- central respiratory regulation disorders

VENTI*motion* and VENTI*logic* are **not suitable for life-support use.**

Use the device only for the purpose described here.

2.2 Functional description

Provision of therapy pressure

An electronically-controlled fan draws in ambient air through a filter and delivers it to the device outlet. From here, the air flows through the hose system and the mask to the patient.

Sensors detect the pressure in the mask and in the hose system and also the respiratory phase switch (trigger point). The fan accordingly provides the IPAP and EPAP pressures set by the doctor.

Therapy modes

The device can be operated in the following therapy modes: CPAP, S, ST, T, SX, SXX, TA (TA with VENTI*logic* only).

In time-controlled mode T and in assisted-controlled mode ST, your doctor can set respiratory frequency in the range from 6 to 45 breaths per minute and inspiration time in the range from 20 % to 67 % of the respiratory period.

In assisted modes S, SX and SXX and in assisted-controlled mode ST, your doctor can select one of 6 trigger levels for both inspiration and exhalation. Your doctor can switch off the trigger for exhalation. Exhalation is then time-controlled.

In the adaptive, controlled TA mode, the device automatically adapts to your personal breathing rhythm and supplies the therapy pressure in exactly the same rhythm.

If no breath is taken into the device in S mode, pressure is switched at a minimum frequency of 6 breaths per minute.

You can activate volume compensation. Minimum volume and maximum pressure rise are set for this purpose. If the minimum volume is undershot, the device automatically increases pressure continuously until the set maximum pressure (therapy pressure + max. pressure rise) is reached.

Other functions

The Softstart function makes it easier to fall asleep. Your doctor sets initial pressures for inspiration and exhalation which continuously rise to the therapy pressures during the Softstart phase. This function can be disabled by the doctor.

The therapy device has an auto switch-on system. If this is activated, the device can be switched on by a breath being taken into the mask. The device is still switched off using the on/off key ⏻.

The display shows therapy mode and, depending on mode, the values currently being applied for CPAP/IPAP and EPAP and for respiratory frequency (f). Spontaneous or mechanical respiratory phase switches are also displayed and the pressure change shown in the form of a graph.

3. Hygiene treatment

3.1 Cleaning and disinfecting in use

Caution!

This item is described in section "5. Hygienic treatment" of the therapy device operating instructions.

There follows a description of the hygiene treatment of the device in the event of repair and in the event of a patient change.

3.2 Cleaning and disinfecting on repair

A dealer should perform the following during a repair!

Caution!
It is essential to follow the instructions issued by the manufacturer of the disinfectant (9.3, page 54). It is recommended that you use suitable gloves for disinfecting (e.g. household rubber gloves or disposable gloves).

- Wipe down outer housing and power supply cable with TERRALIN.
- Clean hose, headgear and nasal mask in accordance with the operating instructions or replace with new parts (depending on condition).
- Open device as per item 7.2.
- Replace filters (coarse dust and fine filter).
- Clean out the inside of device housing and filter housing using a vacuum cleaner, clean extremely soiled areas.
- Close device as per item 7.3.

3.3 Cleaning and disinfecting for a patient change

If the device is to be hygiene-treated for another patient, perform the following steps.

Caution!

It is essential to follow the instructions issued by the manufacturer of the disinfectant (9.3, page 54). It is recommended that you use suitable gloves for disinfecting (e.g. household rubber gloves or disposable gloves).

- Wipe down outer housing and power supply cable with TERRALIN. Dispose of hose and mask system, headgear, exhalation system and carrying bag WM 24888 and replace with new parts.
- Open device as per section 7.2.
- Clean out the inside of the device housing, box and filter holder using a vacuum cleaner, clean extremely soiled areas.
- Replace coarse and fine dust filters **39** + **40**.
- Open box **58** as per section 7.7.
- Spray-disinfect box, lid, fan, fan flap, motor bearing, fan cable, filter holder **37** and filter compartment cover **16 twice** with MIKROZID LIQUID, in each case waiting the prescribed time for the product to take effect. In addition, at the start of the time for the product to take effect, wipe down accessible areas with a cloth wetted in MIKROZID LIQUID.
- Replace the following parts with new parts:
  - hose system WM 24130
  - filters WM 24870 and WM 24880
  - pressure and flow measurement hoses WM 24324, WM 24835
  - hose, pressure side WM 24852

  - device outlet, complete, WM 24025
  - labyrinths WM 24897
  - decoupling tube WM 24028
  - motor frame WM 24898
  - cushioning insert, box WM 24874
  - fan box gasket WM 24868
  - filter holder gasket WM 24151
  - hose, intake side WM 24809
  - foam for expansion space WM 24171
  - foam for filter holder WM 24155
  - countersunk screw ISO 7045-M4x6-V2A-H with Tuflok
- Seal box **58** again as per section 7.7.
- Alternatively, the box **58** can be replaced by a reconditioned box as described in section "7.6 Replace box and filter holder" on page 35.
- Insert device outlet WM 24025
- Replacing the WM 24837 control board
  Note: This is necessary because the flow sensor located on the control board cannot be sterilised.
- Close device as per item 7.3, disinfect outer housing and power supply cable with TERRALIN wipes.
- Reset maintenance symbol to set the maintenance indicator to "0" (see "5.4 Reset maintenance symbol" on page 26).
- Test the device.
- Delete patient data stored in the device as described in the hospital manual for the VENTI*motion*.

3.4 Clean and disinfect humidifier during use

This item is described in section "4. Hygiene treatment" in the VENTI*click* operating instructions.

3.5 Clean and disinfect humidifier on patient change

If the device is to be hygiene-treated for another patient, perform the following steps.

- For hygiene reasons we recommend replacing plastic parts after a maximum period of use of 2 years. The spare parts list can be found in the operating instructions for the VENTI*click*.
- If plastic parts and the heating element are heavily soiled or coated in limescale, offer a new device, otherwise:
  proceed in accordance with section "4. Hygiene treatment" in the operating instructions for VENTI*click*.

3.6 Clean and disinfect the VENTI*power*

This item is described in section "4. Hygiene treatment" in the VENTI*power* operating instructions.

3.7 Clean and disinfect the VENTI-O_2

This item is described in section "4. Hygiene treatment" in the VENTI-O_2 operating instructions.

4. Test the device

4.1 General

Important!
The device must be subjected to the following test following every repair, maintenance and hygienic treatment in accordance with test instruction WM 24827 and the test protocol. The test can also be used to assist during troubleshooting.

For the therapy device, enter the operating hours and all parameters in your service protocol (see page 59).

If you find faults or deviations from target values during the test, you must not use the therapy device again until the faults are eliminated.

The possible causes of the faults and how you eliminate malfunctions can be found in section "6. Malfunctions and rectification" on page 28.

4.2 Test equipment

- Flow measurement device
- Test set WM 23465 incl. 23635 pressure measurement adapter
- PC and PC software VENTI*support*
- Converter box WM 93316
- Connecting cables WM 93312 and WM 96313
- 115 V power source, e.g. travel adapter 230 V/115 V, 200 W
- Test protocol (see "12.2 Test protocol" on page 60)

4.3 Preparation for testing

Check power supply cable

1. Check the power supply cable **2**.

   Ensure that

   – the insulation is OK,
   – the cable is undamaged
   – and there are no loose contacts.

2. Replace the power supply cable **2** if necessary.

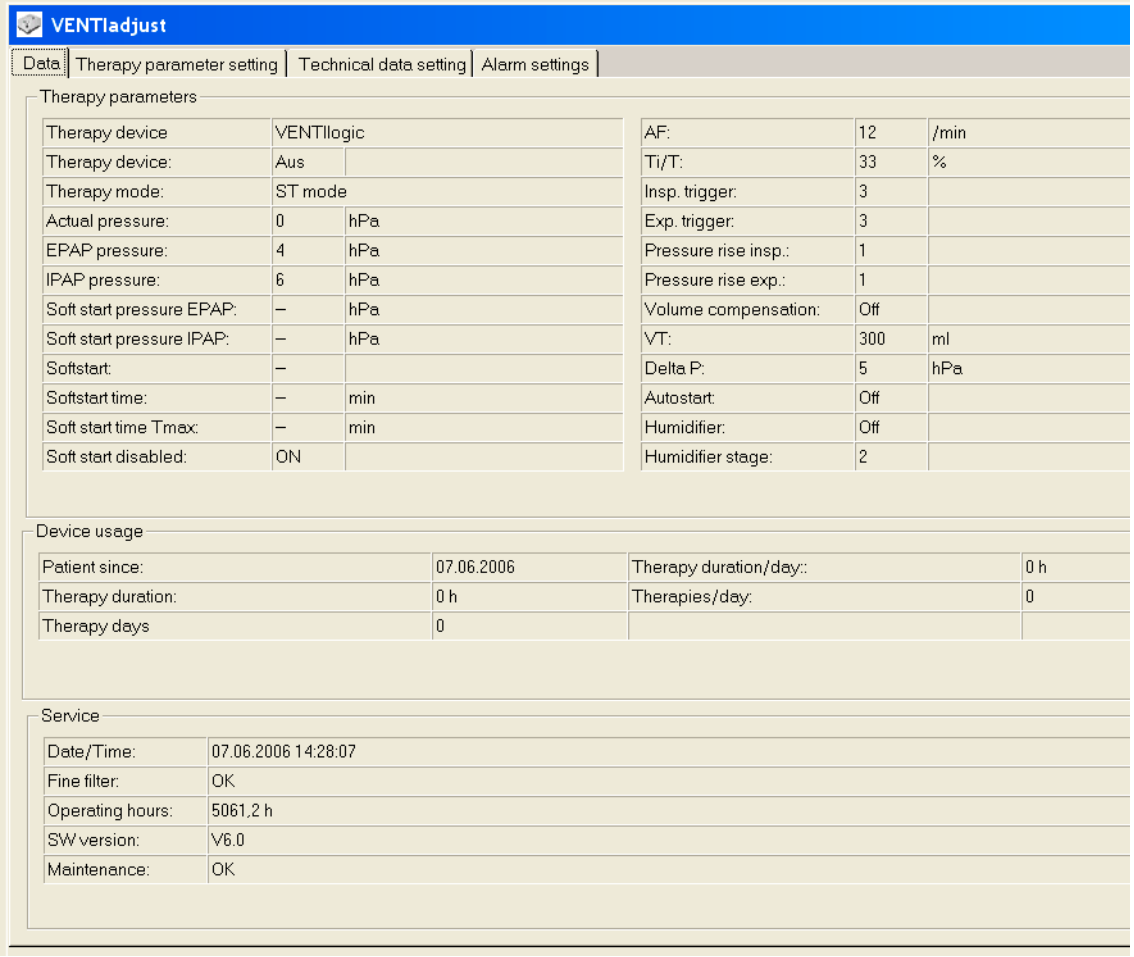
Check housing

Check the housing for general condition.

– If the housing is damaged or defective, replace the relevant side of the device (see "7.13 Replace bottom part of housing" on page 46/"7.14 Replace top part of housing" on page 47).

Connection to VENTI*support*

1. Plug the plug of the power supply cable into a socket.
2. Have the test protocol to hand.
3. Connect the serial interface of the therapy device to the PC via the converter box.
4. Start the VENTI*support* program.
5. Click on the **VENTIadjust** item in the menu bar.



6. Note the set therapy parameters.

4.4 Enter device data

- Enter the type, number and date of manufacture of the device in the test protocol.

4.5 Test temperature calibration and calibration status

Note

This test is not needed, as it can only be performed on a Weinmann test bench.

4.6 Test battery voltage

1. Plug the red drying adapter into the device outlet of the VENTI*motion*.
2. Turn on the device.

   Requirement: if battery voltage is sufficient, **no** maintenance symbol should appear in the display.
3. Replace
4. Turn off the device.

   Note

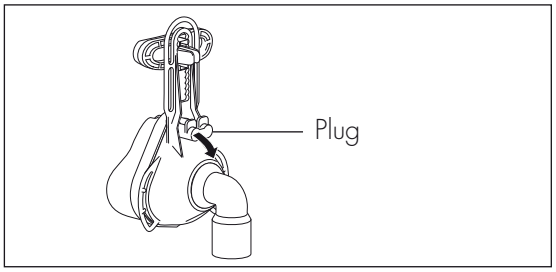
   If battery voltage is inadequate, replace the battery on the control board (see "7.9 Replace battery on control board" on page 42).

4.7 Test interface with the VENTI*click*

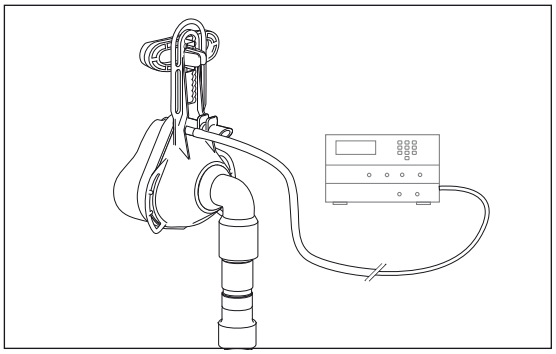
- Check the function of the humidifier (see " Check function of humidifier" on page 21).

4.8 Check target pressure values 5, 20 and 35 hPa

1. Connect the hose system and the mask to the therapy device.
2. Pull a plug off the mask.



3. Connect a pressure meter to the opened connector.
4. Turn on the device.
5. Prepare the therapy device for testing by making the following settings in the “Physician” menu:
   - T mode
   - Frequency f = 6/min
   - Ti:T = 50 %
   - EPAP 5 hPA
   - IPAP 35 hPA

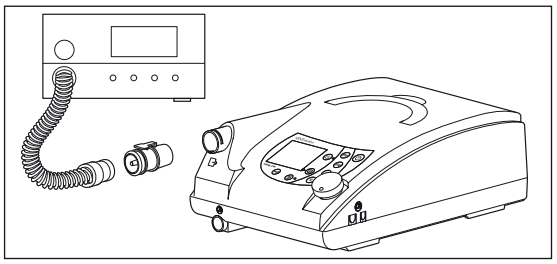


6. Read off the pressure displayed by the measurement device and enter it on the protocol in the “Measuring result” column.
7. Read off the actual pressure displayed by the therapy device and enter it on the protocol in the “Mask” column.
8. Change the setting from EPAP 5 hPA to EPAP 20 hPA.
9. Read off the pressure displayed by the measurement device and enter it on the protocol in the “Measuring result” column.
10. Read off the actual pressure displayed by the therapy device and enter it on the protocol in the “Mask” column.
11. Turn off the device.

Requirement: the values must be within the tolerances quoted in the protocol.

Note
If the values are not within the quoted tolerances, replace the control board (see "7.8 Replace control board/display" on page 39).

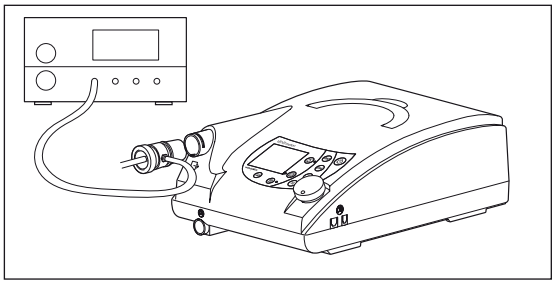
4.9 Test flow measurement



1. Connect the device output of the therapy device to the flow measurement device using the short hose.
2. Turn on the device.
3. Prepare the VENTI*motion* for testing by making the following settings in the "Physician" menu:
   – T mode
   – frequency f = 6/min
   – Ti:T = 50 %
4. Set the two pressures so that the device displays 50 and 100 l/min in the flow window.
   For example: IPAP=10 hPa and EPAP=5 hPa
   Call up the flow window by pressing the rotary knob in the "Physician" menu during operation and selecting “Flow curve” in the **Display** menu.
   Correct the entry for pressures if necessary.
5. Enter the values displayed by the flow measurement device in the protocol.
   Requirement: the values must be within the tolerances quoted in the protocol.
6. Turn off the device.
   Note
   If the values are outside the tolerances, replace the control board (see "7.8 Replace control board/display" on page 39).

4.10 Test leaktightness

1. Plug the test adapter onto the device outlet.
2. Connect the side connection to the pressure measurement device.



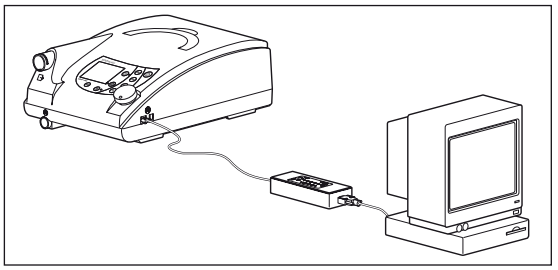
3. Turn on the device. Select CPAP mode in the "Physician" menu and set a pressure of 20 hPa.
4. Read off the pressure displayed by the pressure measurement device and enter it in the protocol.

   Requirement: the values must be within the tolerances quoted in the protocol.
5. Turn off the device.

   Note
   If the value is outside tolerance, dismantle the device (see "7.2 Open device" on page 31) and check for leaks.

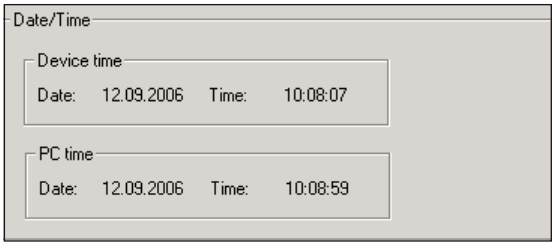
4.11 Test clock function

1. Connect the serial interface of the therapy device to the PC via the converter box.
2. Start the VENTI*support* program.
3. Click on the **VENTIadjust** item in the menu bar.
4. Select the **Set technical data** tab.

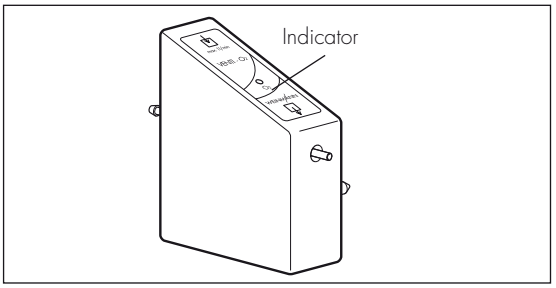


5. Compare "Device time" and "PC time".

   Requirement: the values must change to the same extent.



4.12 Test the interface with the VENTI-O_2



1. Fit a VENTI-O_2 valve to the therapy device so that it is ready to work. The indicator on top of the valve housing does not light up.
2. Close the opening of the nasal mask, using your thumb or hand, for example.
3. Switch on the therapy device first, then your O_2 supply. After the therapy device has been switched on, the valve opens with a soft "click" indicated by the green indicator.
4. You can now set the test flow rate on the flow display of your oxygen system. If this is not possible, first check the function of your oxygen system (is the cylinder empty, for example, or are hoses kinked?).
5. Switch the device off again. The valve audibly switches to "vent", the indicator goes out.

Note
If the VENTI-O_2 valve does not react as described, perform the following measures in sequence and test again in each case.

- Use a different valve.
- Replace the connecting cable of the power board/mains supply unit (see "7.5 Replace power board" on page 34).
- Replace the power board (see "7.5 Replace power board" on page 34).

4.13 Test interface with the VENTI*power*

Note
Before this test is carried out, the therapy device must have been connected to the mains power supply for at least 5 minutes.

1. Fit the VENTI*power* to the therapy device so that it is ready to work therapy device. Connect the therapy device to the mains power supply.
2. Switch on the VENTI*power* and then the therapy device. VENTI*power* is working correctly if its displays go out, in other words, if VENTI*power* switches to standby mode.
3. Now disconnect the plug of the therapy device, the device switches off. The power failure alarm sounds.

VENTI*power* is working correctly if its displays comes on after approx. 4 seconds and the therapy device starts working again.

4. Now restore the mains power supply to the therapy device. VENTI*power* is working correctly if its displays go out, in other words, if VENTI*power* switches to standby mode.
5. Switch off both devices.

4.14 Test noise

Note
This test is not needed, as it can only be performed on a Weinmann test bench.

4.15 Test all keys, the rotary knob and 115 V mode

1. Plug the red drying adapter into the device outlet.
2. Connect the device to a 115 V power source and switch on the device.

Requirement: the device must start working.

3. Press all the keys and the rotary knob to test their function.
4. Turn off the device.

Note
If the keys do not work properly, perform the following measures in sequence and test again in each case.

- Check fascia film and replace if necessary (see "7.12 Replace fascia film" on page 45).
- Replace the control board (see "7.8 Replace control board/display" on page 39).

Note
If the rotary knob does not work properly, perform the following measures in sequence and test again in each case:

- Change the encoder (see "7.11 Replace encoder (dial)" on page 44).
- Replace the control board (see "7.8 Replace control board/display" on page 39).

Note
if 115 V mode does not work properly, replace the mains supply unit (see "7.4 Replace mains supply unit" on page 33).

4.16 Test display incl. backlighting and contrast, the LEDs and the alarm

Note
Before this test is carried out, the VENTI*motion* must have been connected to the mains power supply for at least 5 minutes.

1. Switch on the device.
   A beep sounds. Both LEDs come on briefly.
2. Check whether the display is easy to read with backlighting and that contrast is adequate.

Set contrast

1. Disconnect the power supply plug.
2. Press the humidifier key and the Softstart key simultaneously.
3. Connect the power supply plug and the socket again.
4. Turn the rotary knob to select contrast. Activate contrast by pressing the rotary knob.

Note
If no beep is heard when you switch on, perform the following measures in sequence and test again in each case.

- Test the buzzer and replace if necessary (see "7.13 Replace bottom part of housing" on page 46).
- Replace the control board (see "7.8 Replace control board/display" on page 39).

Note
If the contrast cannot be set, perform the following measures in sequence and test again in each case.

- Check the display cable.
- Replace the display (see "7.8 Replace control board/display" on page 39).
- Replace the control board (see "7.8 Replace control board/display" on page 39).

4.17 Test equipment and accessories (system components)

- Humidifier VENTI*click* present
- Hose system present
- Oxygen supply valve VENTI-O_2 present
- Rechargeable battery VENTI*power* present
- Medical devices manual present (Germany only)
- Operating instructions present

Check function of humidifier

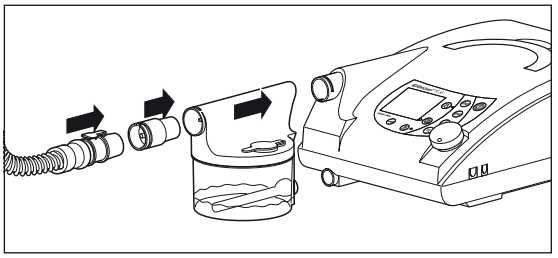
Important!

It is essential to note the heating level set before carrying out this test.

Caution

Perform this test even if the patient has not used or will not be using the humidifier.

1. Subject the plastic housing to a visual check: in the event of cracks/damage and severe soiling, the plastic parts or gaskets should be replaced.
2. Fill the humidifier with water up to the mark.
3. Check whether the humidifier is leaktight.
4. Pour out the water.
5. Now pour in 50 ml of water.
6. Click the humidifier onto the therapy device.
7. Plug the red drying adapter (included in the scope of supply of the therapy device) into the outlet connector of the humidifier.
8. Plug the hose system onto the drying adapter.
9. Turn on the therapy device.
10. Turn on the humidifier by pressing the humidifier key on the therapy device.
11. Set heating level 6 on the therapy device.
12. Check whether the humidifier is heating up.
13. Take off the hose system by pushing the locking button of the adapter.
14. Pull the red drying adapter out of the humidifier by twisting it slightly.
15. Set the heating level back to the value you noted.



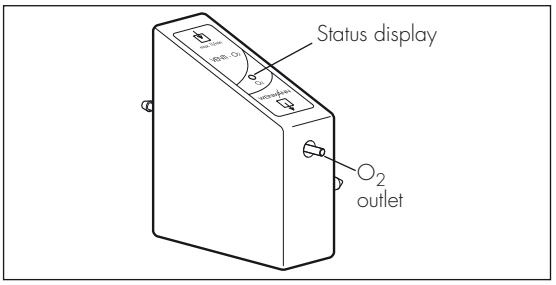
Note

If the humidifier has not heated up, perform the following measures in sequence and test again in each case.

- Use a different humidifier. Is the heating element OK?
- Replace the humidifier socket and cable (see "7.13 Replace bottom part of housing" on page 46).
- Replace the power board (see "7.5 Replace power board" on page 34).

Function check VENTI-O_2

1. Fit the VENTI-O_2 to the therapy device so that it is ready to work. The status display on top of the valve housing does not light up.
2. Attach the test hose supplied (length approx. 48 cm) to the O_2 outlet (⍗).
3. First switch on your therapy device and then your O_2 supply. After the therapy device has been switched on, the valve opens with a soft "click". The green status display lights up.
4. Close the opening of the mask, using a thumb or hand, for example.
5. Set the prescribed flow rate at the flow setting of your oxygen system. If this is not possible, first check the function of your oxygen system (is the cylinder empty, for example, or are hoses kinked?).
6. Hold the free end of the test hose in a glass half-filled with water. VENTI-O_2 is working correctly if bubbles escape from the end of the hose.
7. Switch the therapy device off again. VENTI-O_2 is working correctly if the valve audibly switches to "vent", the status display goes out and no more bubbles escape from the end of the test hose.
8. Shut off the oxygen supply of your oxygen system.



4.18 Once tests are complete

- Reset the therapy values you noted during preparations.

5. Maintenance

5.1 Intervals

Both filters **39** and **40** must be regularly checked for soiling.

- Coarse dust filter **39** needs to be changed every 6 months.
- Fine filter **40** should be changed after no more than 1000 operating hours (filter change symbol appears in the display).

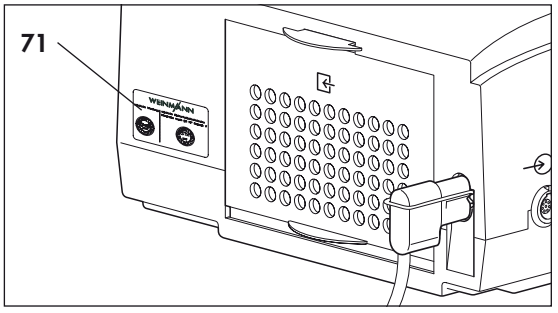
For reasons of hygiene, we recommend replacing the following parts at the intervals stated:

- pressure measurement hose **11** every 6 months or sooner if soiled.
- complete mask system every 6 to 12 months depending on soiling
- exhalation system in accordance with the relevant operating instructions

See section entitled "Cleaning" in the relevant operating instructions.

Servicing should be carried out at the following intervals as a preventive measure:

1. after every 5,000 operating hours (maintenance symbol appears in the display and should be reset after every service),
2. after no more than 2 years (see service label on rear of device).
3. after 10,000 hours or 4 years, clean or replace all parts in the air flow.
4. Replace service label **71** with one with the new data (see "8. Spare parts" on page 48). Cut out the month at a sharp angle using a punch or nail scissors. Affix the new service label to the left-hand side next to the filter flap.



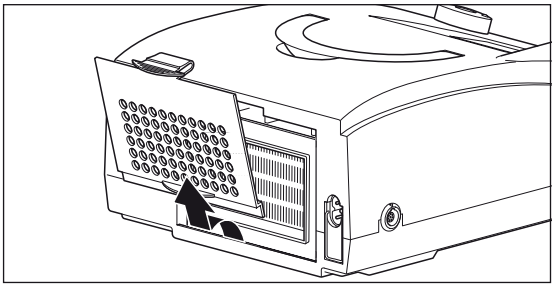
In **Germany**, a safety control as laid down in §6 of the German law relating to owners of medical devices [Medizinprodukte-Betreiberverordnung] must also be carried out every 2 years as specified.

5.2 Filter change

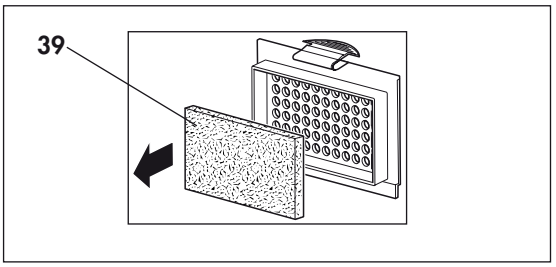
Use only original filters made by Weinmann. If third-party filters are used, this will invalidate the warranty and may cause restrictions in terms of function and biocompatibility.

Coarse dust filter

1. If the VENTI*click* humidifier is connected, first disconnect it from the device. This will prevent water running into the device when the filter is changed. Please also see the operating instructions for the VENTI*click*.
2. Press on the latch of the filter compartment cover and lift it off.



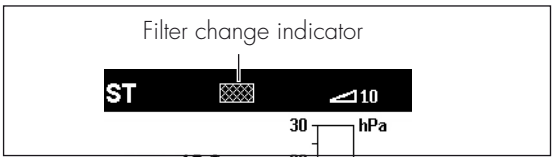
3. Take coarse dust filter **39** out of the filter compartment cover and dispose of it with ordinary domestic waste.
4. Insert clean coarse dust filter **39** in the filter compartment cover.
5. Insert the filter compartment cover into the opening in the housing, bottom edge first. Then push the filter compartment cover into the housing until the latch engages.



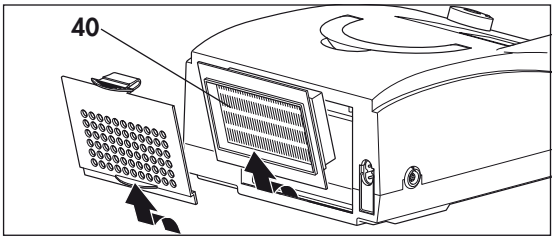
Fine filter

The fine filter needs changing when it has turned dark in colour, but in any event, after no more than 1000 operating hours. In the latter case, when VENTI*motion* is switched on, the message "Change filter!" appears in the display.

Acknowledge the message by pressing the alarm acknowledgement key 🔕. The filter change symbol ▩ then appears continuously in the status line. To change the fine filter, proceed as follows:

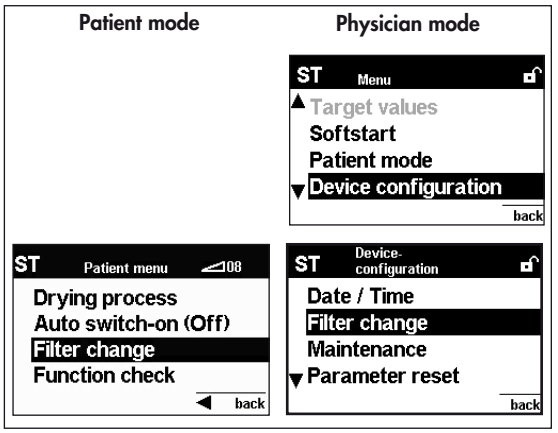


1. Press on the latch of the filter compartment cover and lift it off.
2. Take out fine filter **40** and dispose of it with ordinary domestic waste.
3. Insert a new fine filter **40** WM 15026.
4. Insert the filter compartment cover into the opening in the housing, bottom edge first. Then push the filter compartment cover into the housing until the latch engages.
5. Reset the filter change indicator (see " Reset filter change indicator" on page 25).

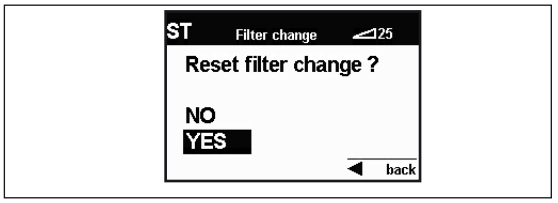


Reset filter change indicator

1. To reset the filter change indicator, press menu key with the device switched on and use the dial to select the item **Filter change** in the Patient menu or in Physician mode, select the menu item **Device configuration** and then **Filter change**. Push the dial to call up the "Filter change" menu.

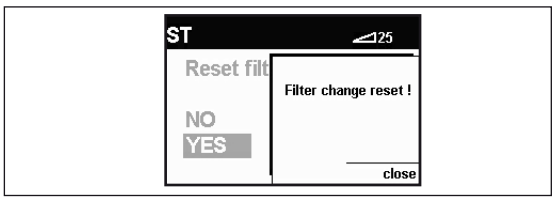


2. The question "Reset filter change?" appears. Use the dial to select **YES** and confirm your selection by pressing the dial.



If you wish to cancel the process, use the dial to select **NO** and press the dial. The process is aborted.

Once you have selected and confirmed **YES** with the dial, the message "Filter change reset!" appears for about 3 seconds.



Bacteria filter

If bacteria filter WM 24148 is used, change the particle filter in the bacteria filter in accordance with the relevant operating instructions.

5.3 Device cleaning

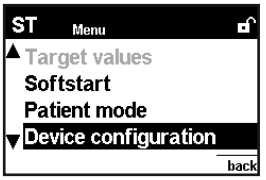
The parts in the air flow should all be cleaned and disinfected every 10,000 hours or every 4 years. This should be performed in accordance with section "3.3 Cleaning and disinfecting for a patient change" on page 11.

After every maintenance operation, perform a test according to section "4. Test the device" on page 13.

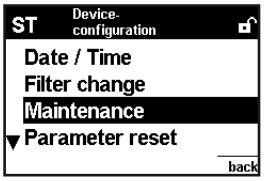
5.4 Reset maintenance symbol

After every service/repair performed, the maintenance indicator must be set to "0", or the maintenance symbol which has appeared in the display deleted. In addition, a new service label (current year +2 years) should be affixed to the rear of the device.

1. Enable Physician functions. Hold down the IPAP and EPAP keys for 4 seconds to do so. The message **"This is a physician function!"** appears in the display. The display then returns to Monitor. The status line of the display shows the symbol . The Physician functions are now enabled.
2. In the **menu**, select the sub-menu **Device configuration**.

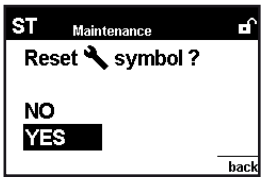


3. Use the dial to select the menu item **Maintenance**. Confirm your selection by pressing the dial.

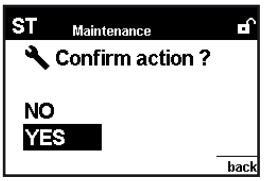


   The **Maintenance** sub-menu is displayed.

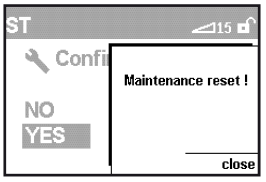
   If you wish to reset the indicator, use the dial to position the selection bar on **YES**. Confirm your selection by pressing the dial.



4. A display appears in which you are asked again whether you wish to reset the symbol. If you are sure, select **YES** here too and confirm your selection by pressing the dial. The message: **"Maintenance reset!"** appears for approx. 2 seconds.



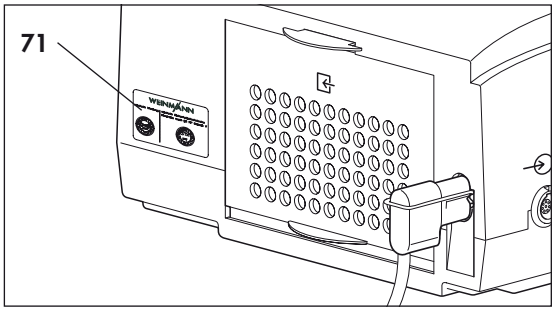
5. To exit the **menu,** press the menu key (**back**) until the **Monitor** is displayed. You can also select **back** with the dial and then press the dial.



5.5 Check the maintenance sticker

When you have maintained the device, a new maintenance sticker (current year +2 years) must be attached to the rear of the device.

- Replace maintenance sticker **71** with one showing the new data (see "8. Spare parts" on page 48). Cut out the month using punch pliers or the tip of a nail cutter. Affix the new maintenance sticker to the left of the filter flap.



5.6 Disposal

Do not dispose of the device with domestic waste. To dispose of the device properly, please contact a licensed, certified electronic scrap disposal merchant. This address is available from your Environment Officer or from your local authority.

6. Malfunctions and rectification

6.1 General faults

Malfunction	Cause	Rectification
No running noise, standby and operating displays do not light up.	No power supply.	Check connection of power supply cable in device socket. Check mains voltage with another device, if necessary (for example a lamp), replace power supply cable if necessary.
	Mains supply unit defective.	Replace mains supply unit (7.4, page 33).
	Cable come loose or defective.	Check all cable connections in the device; replace if necessary.
	Control board defective.	Replace control board (7.8, page 39).
	Power board defective.	Replace power board (7.5, page 34). Send defective board to the manufacturer for fault analysis.
Faulty displays or none at all	Display defective.	Replace display (7.8, page 39).
	Cable come loose or defective.	Check all cable connections in the device; replace if necessary.
	Control board defective.	Replace control board (7.8, page 39).
Tolerance of therapy pressures is > 0.6 hPa after 1 minute.	Control board defective.	Replace control board (7.8, page 39).
	Sensor hoses defective or soiled.	Check hoses, lay correctly (7.8, page 39).
In Automatic mode, device can **not** be switched on by a breath being taken in.	Automatic system not active	Activate auto switch-on/switch-off (see 4.1 of operating instructions).
	Power board defective.	Replace power board (7.5, page 34).
	Control board defective.	Replace control board (7.8, page 39).
Device is running but does not reach the lower pressure limit set.	Filter soiled.	Change both filters (5.2, page 24).
	Nasal mask leaking.	Adjust headgear/headband so that the mask is tight.
	Leak in device.	Check if all hoses and gaskets are properly located.
Filter change indicator active.	Filter soiled.	Clean/change both filters (5.2, page 24).
Maintenance display active.	Maintenance interval exceeded.	Perform maintenance.
	Internal battery discharged.	
Status display of the VENTI-O_2 lights up intermittently or not at all.	No power.	Check that plug contact is properly located.
	Nasal mask leaking.	Adjust headgear/headband so that the mask is tight or use another mask if necessary.
	Hose leaking.	Check breathing hose and pressure measurement hose.
The prescribed O_2 flow is not reached.	O_2 supply hoses kinked.	Check all hose connections.
	Too high a resistance in the hose system.	Shorten O_2 supply hoses.
	Output pressure of oxygen system too low.	If necessary, use another oxygen system, e.g. OXYMAT 3.
Water in humidifier is not heating up.	Humidifier defective.	Test with a different humidifier, if device is defective, return humidifier to the manufacturer.
	Power board defective.	Replace power board (7.5, page 34). Send defective board to the manufacturer for fault analysis.
Power supply cable damaged.		Replace power supply cable.

Device cannot be switched on using the film keypad.	The ribbon cable of the film keypad has slipped out of the connection.	Check whether the ribbon cable is correctly connected to the display board.
	Fascia film defective.	Replace fascia film (7.12, page 45).

6.2 Internal faults

The therapy device performs a self-test of the sensor system when the on/off switch ⏻ is pressed briefly, checking the function of the alarm. If a fault occurs during the self-test, an error message appears in the main screen (see also "6.2 Internal faults" on page 29).

The therapy device can detect internal faults itself and shows them on the display. The display takes the form either of clear text or of a code.

Fault output in clear text

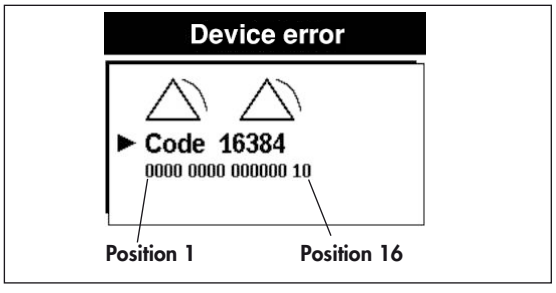
Display	Cause	Rectification
"Battery discharged!"	Internal battery of the device is discharged.	Change the battery (7.9, page 42).
"Clock not set!"	Time not set on device following battery change	Set clock as described in VENTI*motion* hospital manual.
Device error; excessive pressure (Code 32)	Pressure at mask or fan has exceeded maximum permitted limit value.	Check ventilation and pressure measurement hose system for blockages/leaks.
	Pressure measurement hose blocked	
Device error, Upper temperature limit exceeded (Code 64)	The temperature on the power board has reached a critical value, e.g. as a result of operation in the bag or being in direct sunlight.	Leave device to cool down and operate it in the permitted ambient temperature range.

Coded error messages

For faults which are not displayed with a clear text message, the therapy device issues a fault code.

- A number appears in the first line.
- The appropriate 16-digit fault code appears in the second line. Each of the 16 digits has the value "0" or "1". The position of the 1 indicates the kind of fault involved.

A description of the cause of the fault and how to rectify it can be found in the table below.



Note: several errors may occur simultaneously. In this case, a "1" will then appear at several points in the second line. The number in the first line is the total of all the numbers for individual faults.

First line: code number	Second line: 1 at position ...	Cause	Rectification
1	**1**	Clock not responding or battery discharged	Replace battery on control board (see section 7.9 on page 42).
			If fault occurs again, replace control board (see section 7.8 on page 39).
			Replace fan or fan box. (see section 7.7 on page 37).
			Replace power board (see section 7.5 on page 34).
2	**2**	EEPROM not responding	Replace control board (see section 7.8 on page 39).
4	**3**	Transmitting fault at the serial connections.	Replace control board (see section 7.8 on page 39). If this occurs on final test bench, please inform QM.
8	**4**	Sensor measurement has failed plausibility test.	Replace control board (see section 7.8 on page 39).
16	**5**	Fan has failed or fan not starting up. Either there is no 40 V supply or there is a defect on the fan.	Check cable connections between fan, power board and control board.
			Replace fan or fan box (see section 7.7 on page 37).
			Replace power board (see section 7.5 on page 34).
128	**8**	Humidifier current is outside permitted values.	Replace power board (see section 7.5 on page 34).
256	**9**	EEPROM has failed checksum test.	Replace control board (see section 7.8 on page 39).
512	**10**	Sensor calibration data in EEPROM invalid.	Replace control board (see section 7.8 on page 39).
1024	**11**	Pressure sensor measured values outside tolerance	Check external and internal pressure measurement hoses for blockages.
			Replace control board (see section 7.8 on page 39).
2048	**12**	There are invalid therapy parameter values in the EEPROM.	Replace control board (see section 7.8 on page 39). If this occurs on final test bench, please inform QM.
4096	**13**	Data inconsistency, possibly battery discharged	Replace battery on control board (see section 7.9 on page 42).
8192	**14**	No communication with EEPROM.	Replace control board (see section 7.8 on page 39).
16384	**15**	Communication with watchdog failed.	Replace control board (see section 7.8 on page 39).
32768	**16**	Software fault	Replace control board (see section 7.8 on page 39).

7. Repairguide for VENTI*motion*/VENTI*logic*

7.1 General

Perform repairs on the VENTI*motion* or VENTI*logic* exclusively at an ESD protected work-station!

- **Follow the safety rules in the operating instructions for the therapy device.**
- Any handling of the device assumes accurate knowledge and observance of the operatinginstructions and the service and repair guide.
- Only perform repairs which are described in this service and repair guide. This is the only way to guarantee that the therapy device continues to function properly.
- Ensure that your hands and your work-station are clean during repair work.
- Perform a function check after **every** repair (see "4. Test the device" on page 13).
- If you replace components or individual parts, use only original Weinmann parts.
- When ordering the bottom part of the housing **35**, quote the type, year of manufacture and number of the device as well.

Note
The item numbers listed in the text which follows are identical to the item numbers in the spare parts list on page 48 and in the overview on page 4.

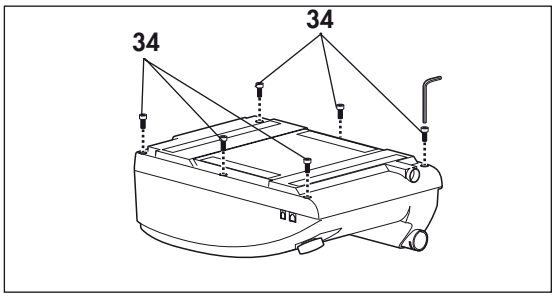
7.2 Open device

Tools and equipment required

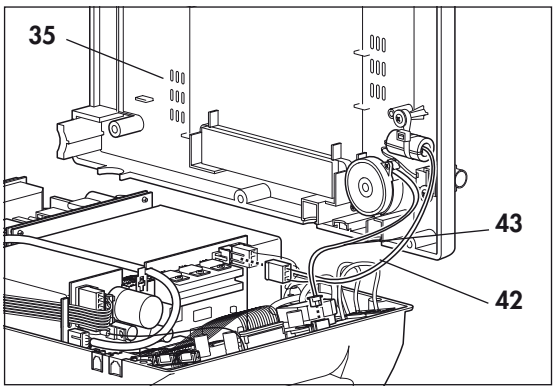
- ESD protected work-station
- 3 mm Allen key

Caution!
Open the device only with the power supply plug disconnected.

1. Place the device on a non-slip surface with the top facing downwards.
2. Remove the filter cassette from the top part of the housing.
3. Undo and remove the 6 screws **34**.



4. Open the bottom part of the housing **35** away to the side.
5. Undo the connecting cables for the humidifier **42** and the alarm **43**.
6. You can now put the bottom part of the housing **35** to one side.

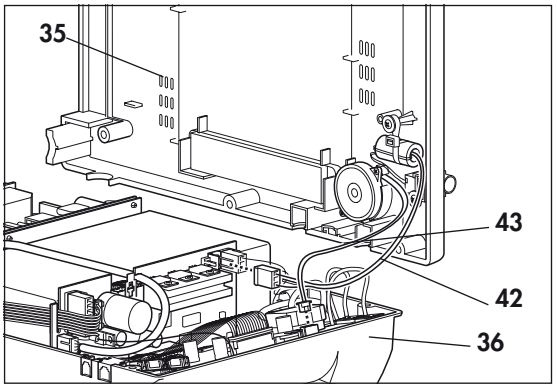


7.3 Close the device

Tools and equipment required

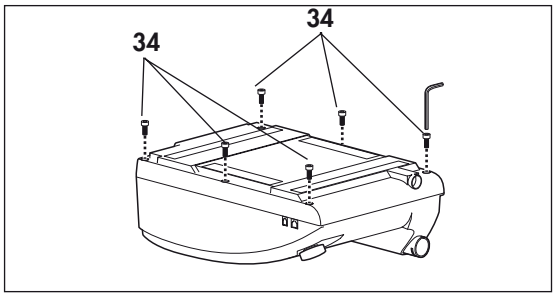
- ESD protected work-station
- 3 mm Allen key

1. Hold the bottom part of the housing **35** up to the side of the top part of the housing **36**.
2. Plug the connecting cables for the humidifier **42** and the alarm **43** onto the relevant connectors.
3. Check that all hoses and cables are plugged on firmly. If necessary, **carefully** plug these fully onto the connections (hoses) or slots (cables).



4. Place the bottom part of the housing **35** on the top part of the housing **36**.

   Ensure that no cables or hoses are trapped or bent.
5. Now screw the top part of the housing tight using the 6 screws **34**.
6. Then turn the device back over.



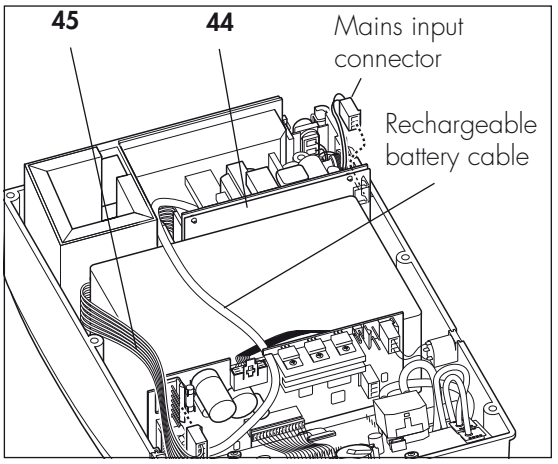
7.4 Replace mains supply unit

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key

1. Open the device (see "7.2 Open device" on page 31).
2. Disconnect the power board/mains supply unit connecting cable **45** from the power board (wide connector).
3. Slightly lift mains supply unit **44** and disconnect the mains input connector from the mains supply unit **44**.
4. Lift the mains supply unit out of the top part of the housing.
5. Disconnect the power board/mains supply unit connecting cable from the mains supply unit and plug into the new mains supply unit.
6. Position the new mains supply unit in the top part of the housing. Plug the mains input connector onto the new mains supply unit in the process.
7. Plug the power board/mains supply unit connecting cable **45** onto the power board (wide connector).

   Caution!
   Be absolutely sure that power board/mains supply unit connecting cable 45 is between the head of the screw and the box as well as in the groove of the power board. Ensure that the rechargeable battery cable is in the groove. Otherwise the cable may be trapped and damaged when the device is closed.
8. Close the device (see "7.3 Close the device" on page 32).
9. Test the device (see "4. Test the device" on page 13).

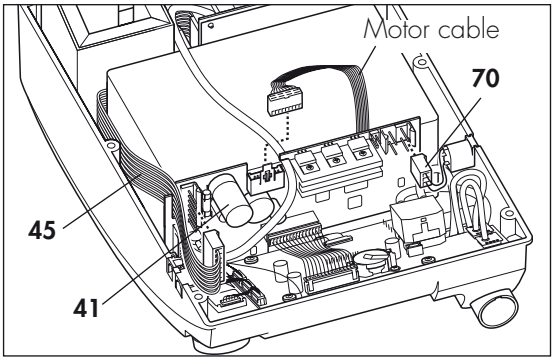


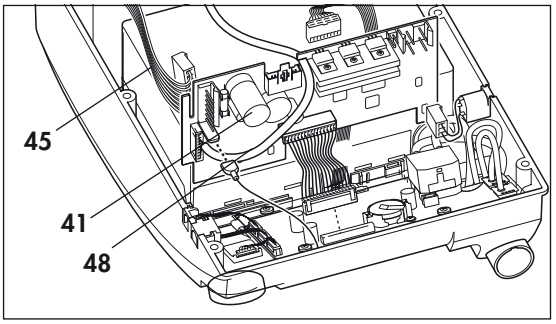
7.5 Replace power board

Tools and equipment required

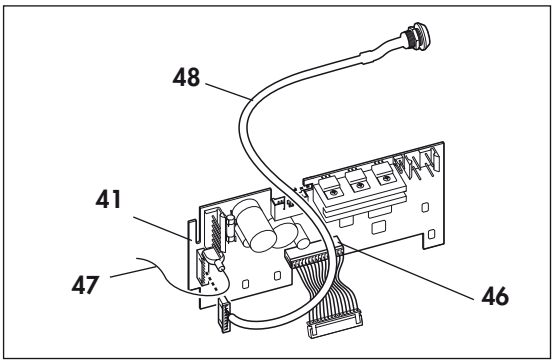
- ESD protected work-station
- 3 mm Allen key

1. Open the device (see "7.2 Open device" on page 31).
2. Disconnect the power board/mains supply unit connecting cable **45** from the power board **41** (wide connector).
3. Disconnect the motor cable.
4. Disconnect the O_2 valve/power board connecting cable **70** from the power board.
5. Disconnect all connecting cables from the control board.
6. Remove the power board from the top part of the housing.
7. Take the rechargeable battery connecting cable **48** out of the groove and disconnect it from the power board **41**.





8. Disconnect the cables of the old power board and plug them into the appropriate slots of the new power board **41**:
   - power board/control board connecting cable **46** (wide connector)
   - rechargeable battery connecting cable **48**
   - earth cable **47**
9. Connect the power board/mains supply unit connecting cable **45** to the power board.
10. Position the new power board in the top part of the housing.
11. Restore the connections to the control board.
12. Connect the O_2 valve connecting cable to the new power board.
13. Plug the motor cable back on.



14. Insert the rechargeable battery connecting cable into the groove on the power board.

    Caution!
    Be absolutely sure that the power board/mains supply unit connecting cable 45 is between the head of the screw and the box as well as in the groove of the power board. Ensure that the rechargeable battery cable is in the groove. Otherwise the cable may be trapped and damaged when the device is closed.

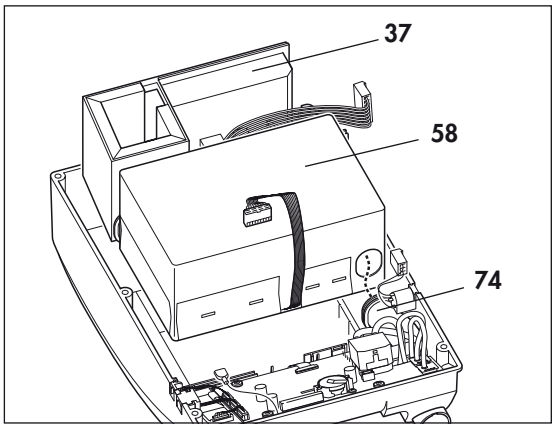
15. Close the device (see "7.3 Close the device" on page 32).
16. Test the device (see "4. Test the device" on page 13).

7.6 Replace box and filter holder

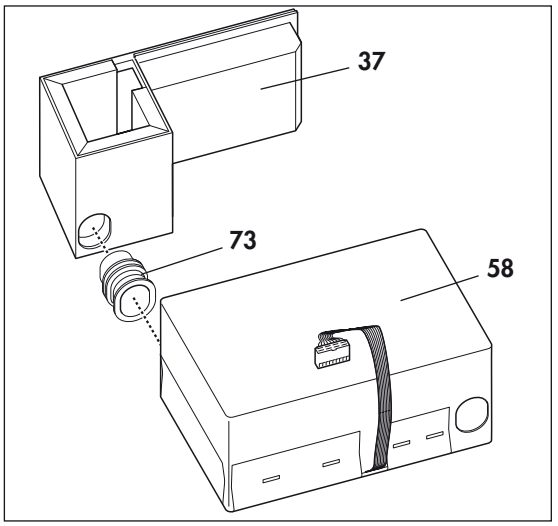
Tools and equipment required

- ESD protected work-station
- 3 mm Allen key

1. Open the device (see "7.2 Open device" on page 31).
2. Remove the power board (see "7.5 Replace power board" on page 34).
3. Remove the mains supply unit (see "7.4 Replace mains supply unit" on page 33).
4. Release the pressure-side hose **74** (connection to device outlet) from the box.
5. Lift box **58** and filter holder **37** out of the top part of the housing together.



6. Disconnect the box and the filter holder from one another by undoing the intake-side hose **73** from both parts.

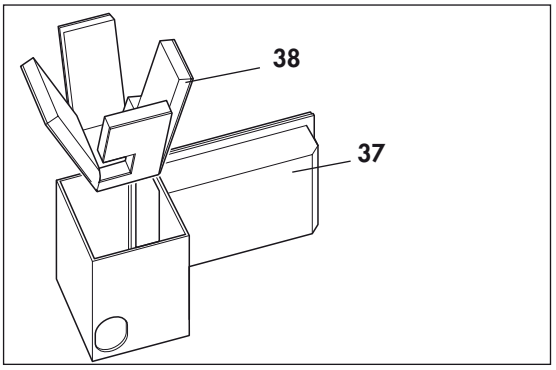


7. Dispose of the foam **38** from the expansion space and replace box **58**.

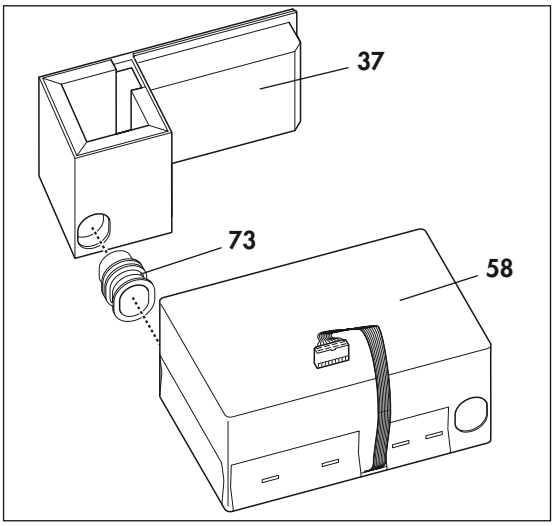
   or:

   Replace the complete filter holder **37**.

8. If you have not replaced the filter holder, insert a new piece of foam **38** in the expansion space.



9. Connect box and filter holder. To do so, insert the intake-side hose in both parts. The smooth part of the hose must be inserted in the filter holder in each case.
10. Insert the box and the filter holder back in the device (steps **4.** to **6.** in reverse sequence). To facilitate assembly of the intake-side hose **73**, apply a little 70 % isopropanol to the circumference.
11. Refit the mains supply unit (see "7.4 Replace mains supply unit" on page 33).
12. Refit the power board (see "7.5 Replace power board" on page 34)
13. Close the device (see "7.3 Close the device" on page 32).
14. Test the device (see "4. Test the device" on page 13).



7.7 Replace fan

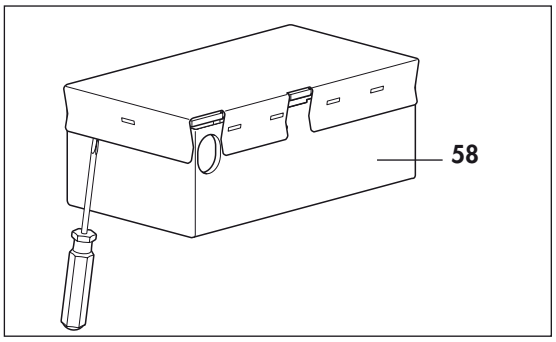
Tools and equipment required

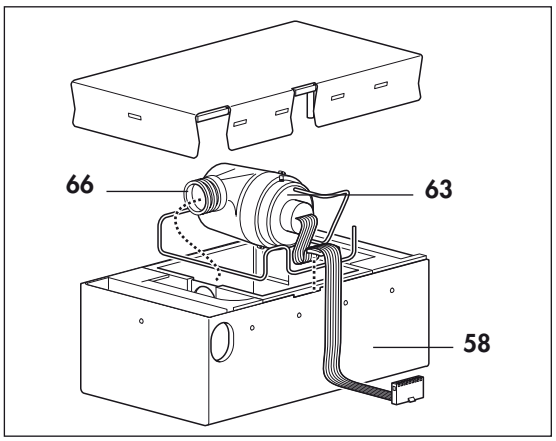
- ESD protected work-station
- 3 mm Allen key

1. Open the device (see "7.2 Open device" on page 31).
2. Remove the power board (see "7.5 Replace power board" on page 34).
3. Remove the mains supply unit (see "7.4 Replace mains supply unit" on page 33).
4. Remove box and filter holder (see "7.6 Replace box and filter holder" on page 35).
5. Open the box. To do so, lift the lid using a slot screwdriver. Then remove the lid of the box.
6. Lift fan **63** up and disconnect decoupling tube **66** from the bore of the motor frame.
7. Remove fan **63** from box **58**.

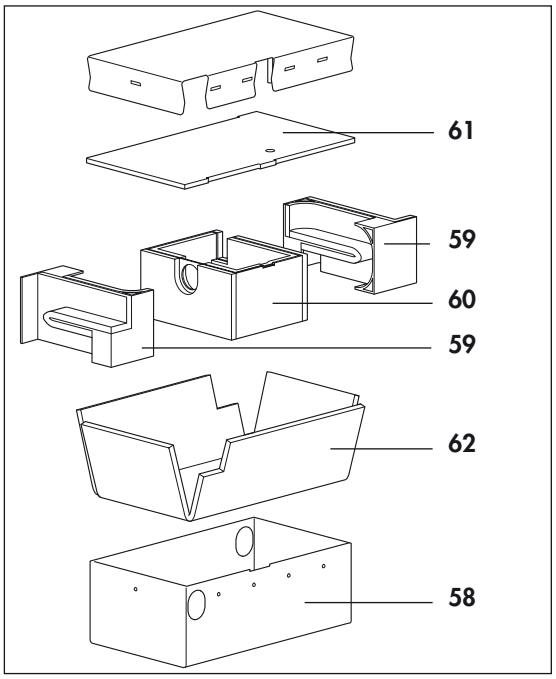
   If the same patient is going to be using the device, continue the repair from step **15.**

   If box **58** is to be treated for a new patient or be subjected to cleaning in the course of the 10,000-hour/4-year service, then proceed as follows.

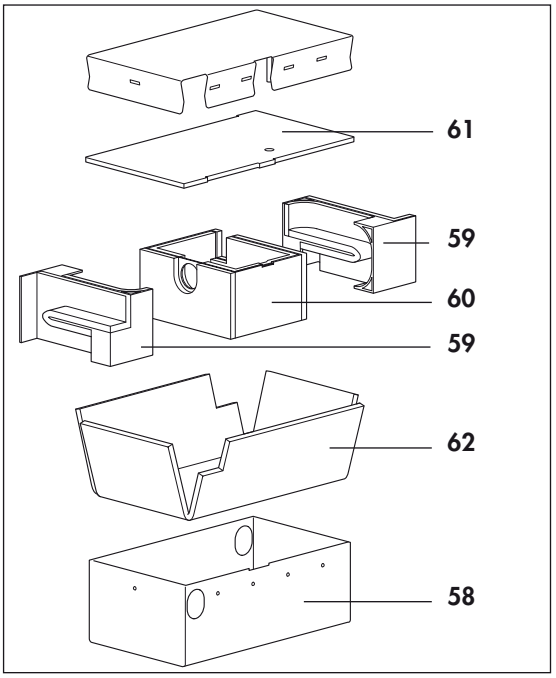




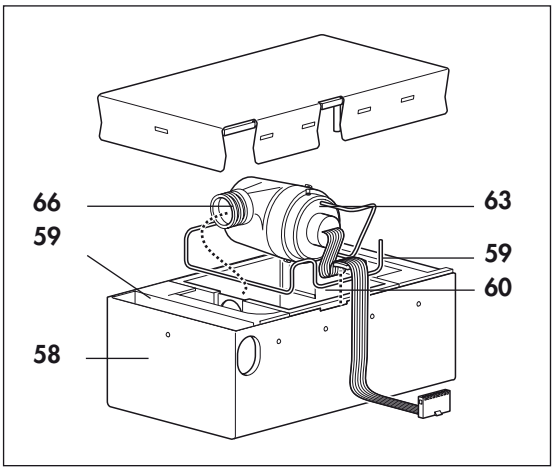
8. Remove motor frame **60** and the labyrinths **59** from the box and dispose of them.
9. Remove lid cushioning insert **61** and box cushioning insert **62** from the box and dispose of them.
10. Clean out the box using a vacuum cleaner and clean extremely soiled areas.
11. Disinfect the box using MIKROZID LIQUID (follow the manufacturer's instructionsfor use).



12. Insert a new lid cushioning insert **61** and box cushioning insert **62** as shown, as well as the two new labyrinths **59** and motor frame **60** in box **58**.
    Take care with the assembly position.
    - Insert the labyrinths as shown.
    - Insert motor frame **60** so that the cutout for the fan cable is flush with the cutout in the box. Otherwise the fan cable might be damaged when the box is closed.
13. **Tip!**
    Put motor frame **60** and labyrinths, **59** together with box cushioning insert **62**, in box **58**.
    Clean the fan and then disinfect it using MIKROZID LIQUID (follow the manufacturer's instructions).
14. Fit the fan flap with two new screws **68** from the maintenance kit.



15. Insert fan **63** in motor frame **60**.
16. Apply a little 70 % isopropanol to the circumference of decoupling tube **66** and fit it in the appropriate bore of motor frame **60**.
    The groove of the hose must engage right round the circumference of the bore.
17. Put the lid on box **58**.
    Ensure that the lid is fitted in the correct position. The cable harness of the fan must run through the cutout in the lid and may not be trapped! The cable must protrude between 265 and 270 mm.
18. Refit the box and filter holder (see "7.6 Replace box and filter holder" on page 35)
19. Refit the power board (see "7.5 Replace power board" on page 34).
20. Refit the mains supply unit (see "7.4 Replace mains supply unit" on page 33).
21. Close the device (see "7.3 Close the device" on page 32).
22. Test the device (see "4. Test the device" on page 13).



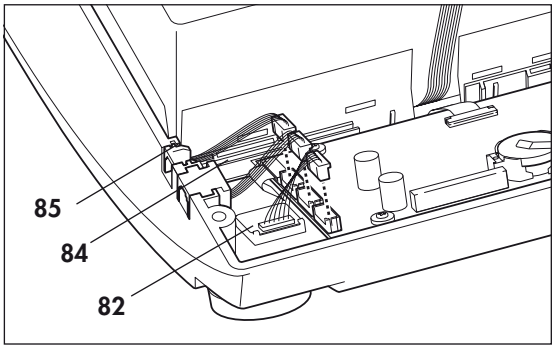
7.8 Replace control board/display

Perform repair

Tools and equipment required

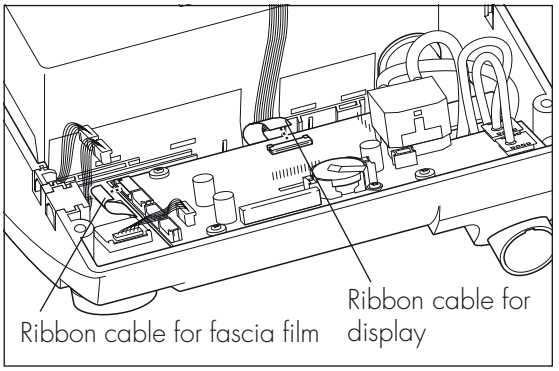
- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device (see "7.2 Open device" on page 31).
2. Remove the power board (see "7.5 Replace power board" on page 34).
3. Disconnect the encoder connector **82** and the connectors of interfaces **84** and **85** of the control board.

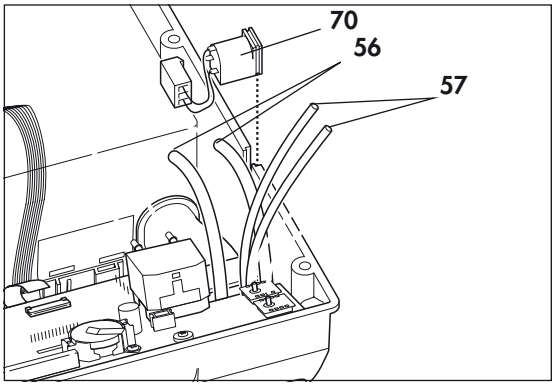


4. Disconnect the ribbon cable of the display and the fascia film:
   to do so, pull the latch out until you feel resistance. You can then pull out the ribbon cable.

   Caution!
   If the latch has not been opened correctly, the ribbon cable may be damaged when it is pulled out.

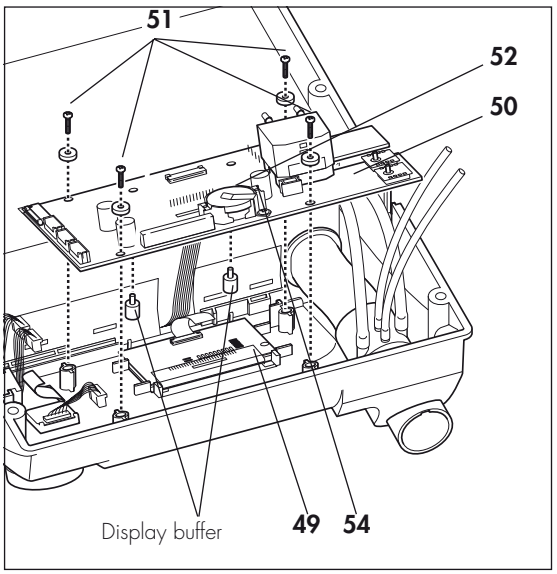


5. Pull flow measurement hoses **56** off the flow sensor.
6. Pull pressure measurement hoses **57** off the pressure sensors.



7. Undo the four screws **51** and remove control board **50**.
8. Remove spring **54** from the control board and remove battery **52** (see "7.9 Replace battery on control board" on page 42). You need the metal spring for the new control board.

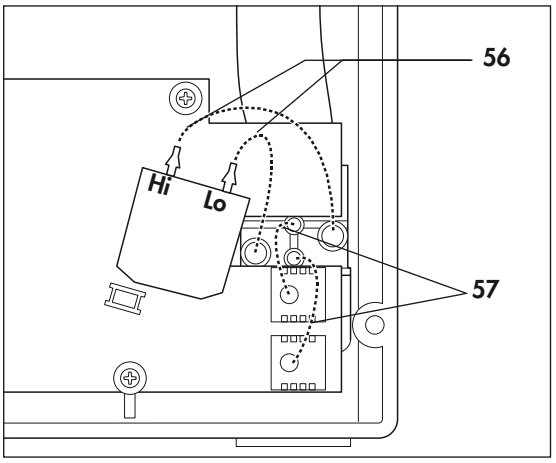
   If it is unnecessary to replace the display, continue from step **11.**
9. Remove display **49**.



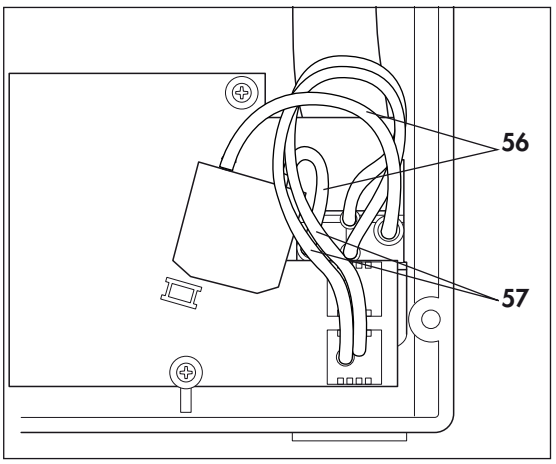
10. Insert a new display **49**.

    Caution!
    The display may not tilt and must be straight in the guides.
11. Insert a new battery **52** in the appropriate holder of the new control board and screw on spring **54** (see "7.9 Replace battery on control board" on page 42).
12. Put the control board in the top part of the housing and attach it with the four screws **51**.
13. Reattach the pressure measurement hoses **57** to the pressure sensors.

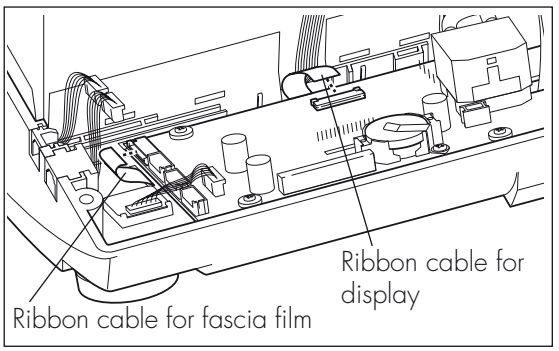
    Ensure that you do not switch the hoses: connect the connection of the flow sensor marked **Hi** to the hose connector marked **Hi** at the device outlet.
14. Attach the flow measurement hoses **56** to the flow sensor.



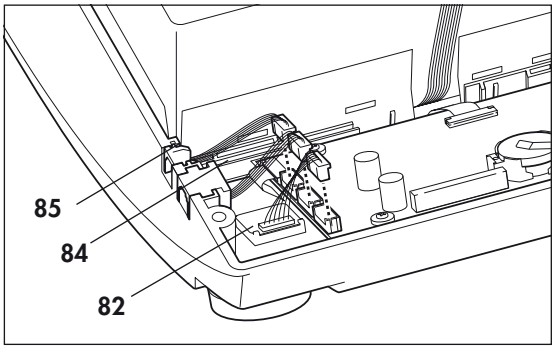
    Ensure that you do not switch the hoses: connect the connection of the flow sensor marked **Lo** to the hose connector marked **Lo** at the device outlet.
15. To prevent hoses kinking, position flow measurement hoses **56** and pressure measurement hoses **57** as shown.



16. Connect the ribbon cable for the fascia film and the display to the control board again:
    - pull the latch upwards.
    - push the ribbon cable into the connector.
    - press the latch back down.



17. Plug the connectors of the interfaces and the rotary knob into the appropriate slots of the control board.
18. Refit the box and filter holder (see "7.6 Replace box and filter holder" on page 35).



19. Refit the power board (see "7.5 Replace power board" on page 34).
20. Close the device (see "7.3 Close the device" on page 32).
21. Check contrast and adjust if necessary (see "4.16 Test display incl. backlighting and contrast, the LEDs and the alarm" on page 20).
22. **Reset the date and time,** as described in the VENTI*motion*/VENTI*logic* hospital manual.

    Caution!
    After changing the control board, always set the date in the following sequence: 1. YEAR, 2. MONTH, 3. DAY, otherwise you may get a faulty display.
23. Test the device (see "4. Test the device" on page 13).

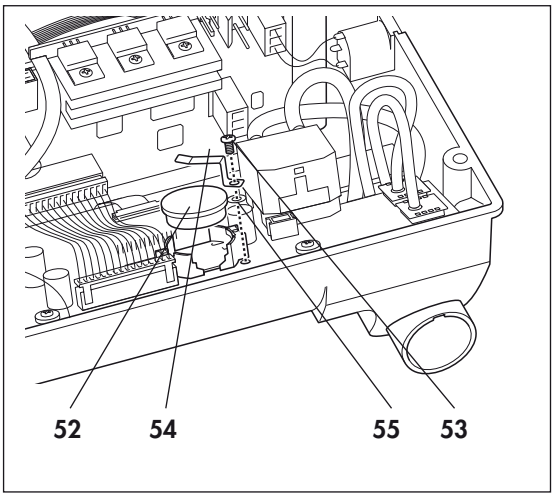
7.9 Replace battery on control board

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device (see "7.2 Open device" on page 31).
2. Undo the screw **53** on the battery holder and take spring **54** and seal **55** off control board **50**. Put the parts on one side.
3. Take battery **52** out of the holder on the control board.
4. Put in a fresh battery **52**.
5. Insert spring **54** and seal **55** on the battery holder on control board **50** and fit both parts with screw **53**.
6. Close the device (see "7.3 Close the device" on page 32).
7. **Reset the date and time** as described in the VENTI*motion*/VENTI*logic* hospital manual.

   Caution!
   After changing the control board, always set the date in the following sequence: 1. YEAR, 2. MONTH, 3. DAY, otherwise you may get a faulty display.
8. Test the device (see "4. Test the device" on page 13).



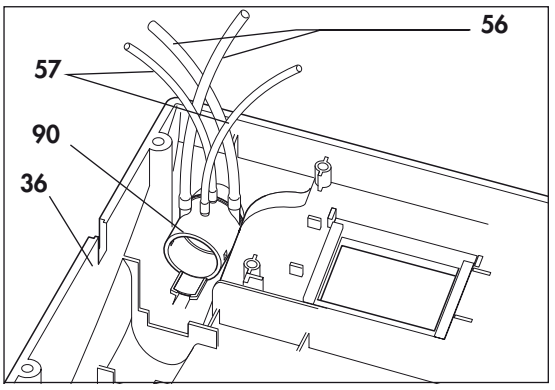
7.10 Dismantle device outlet

Tools and equipment required

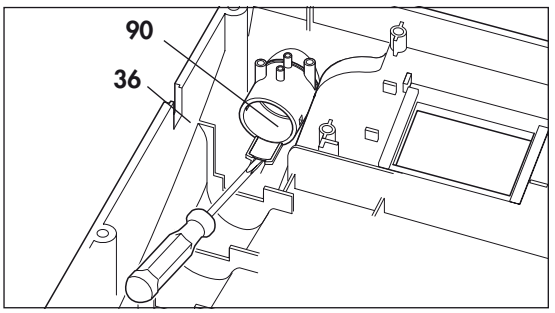
- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device (see "7.2 Open device" on page 31).
2. Remove the mains supply unit (see "7.4 Replace mains supply unit" on page 33).
3. Remove the power board (see "7.5 Replace power board" on page 34).

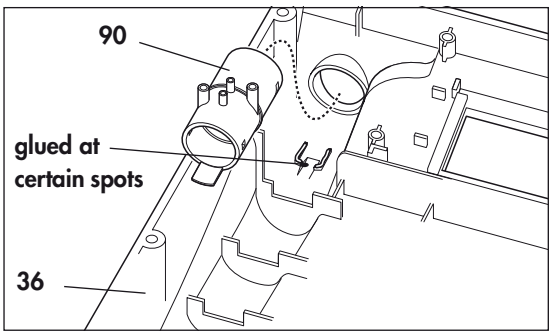
4. Remove box and filter holder (see "7.6 Replace box and filter holder" on page 35).
5. Remove the control board (see "7.8 Replace control board/display" on page 39).
6. Pull the pressure-side hose off device outlet **90**. Dispose of the pressure-side hose (only when servicing or changing patients).



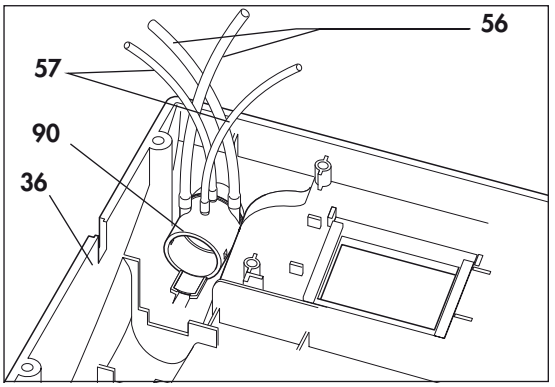
7. Pull flow measurement hoses off the flow sensor. Dispose of flow measurement hoses **56**.
8. Pull pressure measurement hoses **57** off the device outlet. Dispose of pressure measurement hoses.
9. Remove device outlet **90** from the top part of the housing **36**. To do so, lift the tab slightly using a screwdriver and take out the device outlet.



10. Remove any adhesive residues from the housing.
11. Place a spot of glue on the lock: Ø ≤ 1 mm; glue WM 14946 (Loctite 4601) or WM 14952 (Loctite 4031).
12. Fit a new device outlet **90** in the top part of the housing **36**.



13. Put new pressure measurement hoses **57** on the relevant connectors of device outlet **90**.
14. Put new flow measurement hoses **56** on the relevant connectors of device outlet **90**.
15. Refit the control board (see section 7.8 on page 39)
16. Refit the box and filter holder (see section 7.6 on page 35).
17. Refit the power board (see section 7.5 on page 34).
18. Refit the mains supply unit (see section 7.4 on page 33).
19. Close the device (see section 7.3 on page 32).
20. Test the device (see "4. Test the device" on page 13).



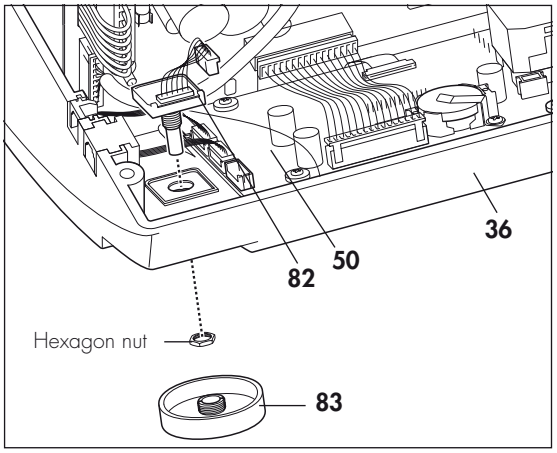
7.11 Replace encoder (dial)

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- 11 mm Allen key adapter

Note
If you only want to replace the dialknob, simply pull this off the spindle of the encoder and replace it by a new one. To replace the entire encoder, proceed as described below.

1. Open the device (see section 7.2 on page 31).
2. Pull dial **83** off the spindle of encoder **82**.
3. Unscrew the hexagon nut on the outside of the top part of the housing **36**.
4. Pull the cable of encoder **82** off control board **50**.
5. Take the encoder out of the top part of the housing from the inside.
6. Insert the new encoder in the top part of the housing.
7. Screw the hexagon nut onto the spindle of the encoder from the outside. Tighten up the nut. **Ensure that the spindle of the encoder turns easily.**
8. Plug the cable of the encoder onto the control board.
9. Push the dial onto the spindle of the encoder up to the stop. Check whether the dial turns easily.
10. Close the device (see section 7.3 on page 32).
11. Test the device (see "4. Test the device" on page 13).

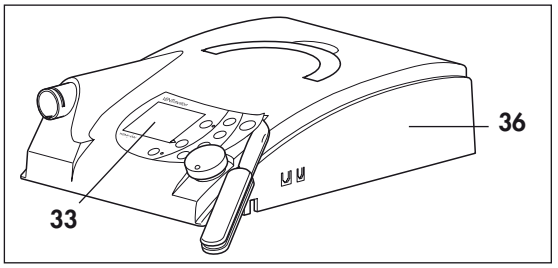


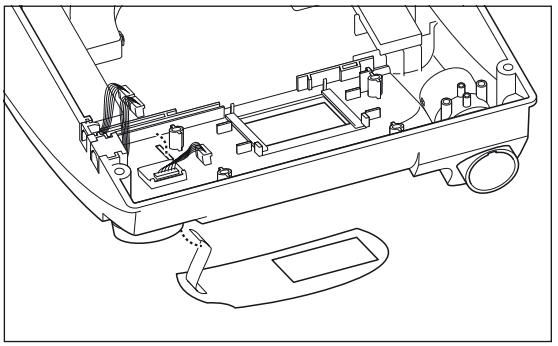
7.12 Replace fascia film

Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1
- Knife with a smooth, flat blade

1. Open the device (see section 7.2 on page 31).
2. Remove the mains supply unit (see section 7.4 on page 33).
3. Remove the power board (see section 7.5 on page 34).
4. Remove box and filter holder (see section 7.6 on page 35).
5. Remove the control board and the display (see section 7.8 on page 39). Undo fascia film **33** using a knife-blade and carefully peel it off. Use a little 70 % isopropanol to degrease this part of the housing.





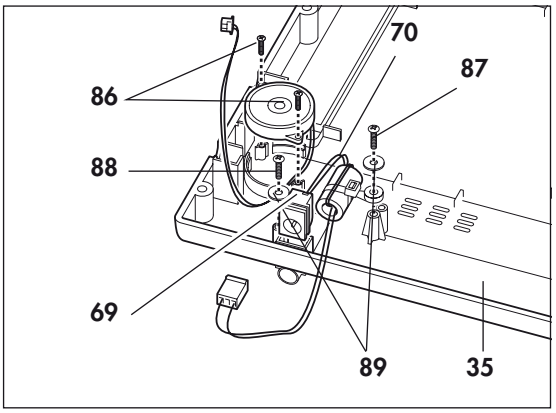
6. Peel the protective film off the inside of the new fascia film and affix fascia film **33** to this area of the housing. Ensure that the ribbon cable is pushed cleanly through the opening in the housing without any kinks.
7. Carefully pull the outer protective film off the new fascia film using a fingernail.
8. Refit the display and the control board (see section 7.8 on page 39).
9. Refit the box and filter holder (see section 7.6 on page 35).
10. Refit the power board (see section 7.5 on page 34).
11. Refit the mains supply unit (see section 7.4 on page 33).
12. Close the device (see section 7.3 on page 32).
13. Test the device (see "4. Test the device" on page 13).

7.13 Replace bottom part of housing

Tools and equipment required

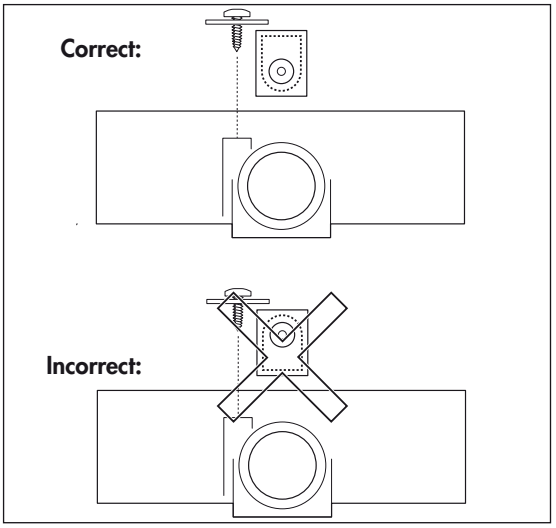
- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1
- Torque wrench 20 – 120 Ncm

1. Open the device (see section 7.2 on page 31).
2. Undo screws **87** of the humidifier socket and the ferrite core.
3. Pull connecting cable **70** for the humidifier out upwards.
4. Undo screws **86** and remove the alarm (piezo buzzer).
5. Remove the foam for the expansion space.
6. Remove the plug locators for the O_2 valve.



You have now dismantled all parts. Now start assembling into the new bottom part of the housing **35**.

7. Insert the plug locators for the O_2 valve in the new bottom part of the housing.
8. Put the foam for the expansion space back in.
9. Refit the alarm (piezo buzzer) and fix it in position with the two screws **86**. **Tighten the screws with a torque of 47 Ncm.**
10. Put connecting cable **70** into the plug locator with the radius of the plug side facing **downwards**. Both webs of the plug must be located **within** the plug locator for this.
11. Fix connecting cable **70** in position with lock washer **69** and screws **87** and **88**.
12. Close the device (see section 7.3 on page 32).
13. Test the device (see "4. Test the device" on page 13).



7.14 Replace top part of housing

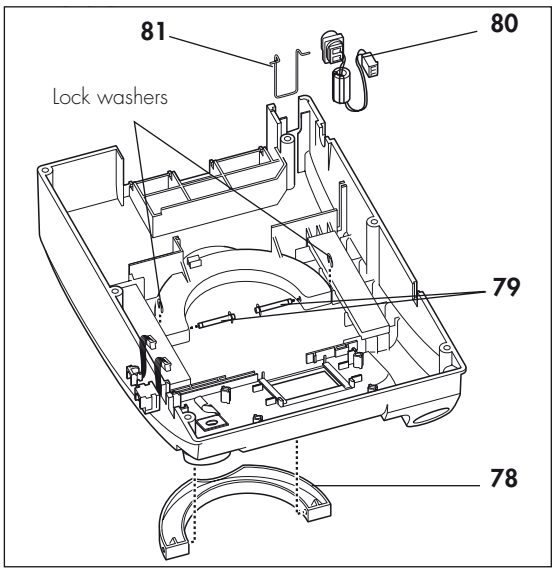
Tools and equipment required

- ESD protected work-station
- 3 mm Allen key
- Phillips screwdriver, size 1

1. Open the device (see section 7.2 on page 31).
2. Remove the mains supply unit (see section 7.4 on page 33).
3. Remove the power board (see section 7.5 on page 34).
4. Remove box and filter holder (see section 7.6 on page 35).
5. Remove the control board (see section 7.8 on page 39).
6. Remove the device outlet (see section 7.10 on page 42).
7. Remove the lock washers from pins **79**.
8. Push pins **79** out of the hinges and take handle **78** off the top part of the housing.
9. Remove mains input connector **80** and cable securing clip **81**.

You have now dismantled all parts. Now start assembling into the new top part of the housing **36**.

10. Take the new top part of the housing **36** in your hand and insert handle **78** in the top part of the housing.
11. Push pins **79** into the hinges and fit the lock washers.
12. Fit the device outlet (see section 7.10 on page 42).
13. Refit the display and the control board (see section 7.8 on page 39).
14. Refit the box and filter holder (see section 7.6 on page 35).
15. Refit the power board (see section 7.5 on page 34).
16. Refit mains input connector **80** and cable securing clip **81**.
17. Refit the mains supply unit (see section 7.4 on page 33).
18. Close the device (see section 7.3 on page 32).
19. Test the device (see "4. Test the device" on page 13).



8. Spare parts

8.1 List of spare parts for VENTI*motion*/VENTI*logic*

Note
The item numbers in the table are identical to the numbers in the text of this service and repair guide. There are gaps in the numbering because the numbers were assigned in the operating instructions, but not all parts are spare parts.

Item no.	Name	Article no.
2	Power supply cable	WM 24177
8	Plug for pressure measurement hose	WM 24115
11	Pressure measurement hose	WM 24038
12	Hose system	WM 24130
16	Filter flap	WM 24180
31	Carrying bag	WM 24888
33	Fascia film for VENTI*motion* Fascia film for VENTI*logic*	WM 24833 WM 27033
34	Cap screw M4 x 12-8.8 ST-ZN	WM 50605
35	Housing, bottom part with nameplate	WM 24887
36	Housing, top part with fascia film, VENTI*motion* Housing, top part with fascia film, VENTI*logic*	WM 24804 WM 27028
37	Filter holder, complete	WM 24150
38	Foam, expansion space	WM 24171
39 **40**	Set of spare filters (sufficient for a year) Coarse dust filter Fine dust filter	WM 15682 WM 24880 WM 15026
41	VENTI*motion*: Printed circuit, power board, new Printed circuit, power board, replacement VENTI*logic*: Printed circuit, power board, new Printed circuit, power board, replacement	 WM 24840 WM 24849 WM 27090 WM 27099
42	Connecting cable for humidifier, ferrite core	WM 24254
43	Piezo buzzer/alarm	WM 24109
44	Mains supply unit with insulating board	WM 24213
45	Connecting cable for power board/mains supply unit	WM 24861
46	Connecting cable for power board/control board	WM 24307
47	Cable, earth	WM 24813
48	Rechargeable battery socket with cable (connecting cable for rechargeable battery socket/power board)	WM 24507
49	LC display	WM 24828
50	Printed circuit, control board, new Printed circuit, control board, reconditioned	WM 24890 WM 24837

Item no.	Name	Article no.
51	Screw with washer KB 25 x 12 with washer 9-3-3 (for control board)	WM 24812
52	Battery, 3 V	WM 24946
53	Tallow-drop screw M 3 x 6 (for spring to secure battery)	WM 53020
54	Spring for battery	WM 24953
55	Seal	WM 1145/32
56	Connecting hose, silicone 3 x 7, 130 mm long	WM 24835
57	Pressure measurement hose, silicone 2.5 x 1.5, 200 mm long	WM 24324
58	Fan box, complete, new Fan box, complete, reconditioned	WM 24832 WM 24838
59	Labyrinth, self-adhesive	WM 24897
60	Motor frame, self-adhesive	WM 24898
61	Cushioning insert, lid (fan box gasket)	WM 24868
62	Cushioning insert, box	WM 24874
63 **64** **65** **66** **67**	Fan with bearing consisting of: – fan, complete – motor bearing – decoupling tube – threaded pin DIN 916, M4 x 6-V2A	WM 24848 WM 24834 WM 24862 WM 24028 WM 50743
	Fan, complete, new Fan, complete, reconditioned	WM 24834 WM 24839
68	Countersunk screw ISO 7045 M4 x 6 (for fan)	WM 51393
69	Lock washer, humidifier cable	WM 24088
70	Connecting cable for O_2valve)	WM 24117
71	Service label * – for 2007 – for 2008 – for 2009 – for 2010 – for 2011 – for 2012	 WM 0438 WM 0498 WM 0499 WM 0300 WM 0609 WM 0610
72	Safety test label * – for 2007 – for 2008 – for 2009 – for 2010	only for internal Weinmann use
73	Hose, intake side	WM 24809
74	Hose, pressure side	WM 24852
75	Bacteria filter, complete	WM 24148
76	Hose system, sterilizable	WM 24120
77	Fine filter, packed	WM 15026
78	Handle	WM 24190
79	Pin	WM 24210

*When ordering, quote type, device no. and year of manufacture

Item no.	Name	Article no.
80	Mains input plug	WM 24853
81	Cable securing clip, strain relief	WM 24317
82	Encoder	WM 24090
83	Dial	WM 24101
84	Western socket, 6-pin	WM 24508
85	Western socket, 4-pin	WM 24854
86	Screw WN5412 (for piezo buzzer)	WM 50553
87	Tallow-drop screw KB 30 x 20	WM 22597
88	Tallow-drop screw KB 30 x 6	WM 22597
89	Washer	WM 24088
90	Device outlet, complete	WM 24025
	VENTI*support*, complete	WM 93340
	VENTI*support*, software	WM 93350
	Converter box	WM 93360
	VENTI-O_2, packed	WM 24200
	Operating instructions VENTI*motion* DE	WM 16836
	Operating instructions VENTI*motion* FR; NL; IT	WM 16837
	Operating instructions VENTI*motion* GB; ES; PL	WM 16838
	Operating instructions VENTI*motion* SE; DK; NO	WM 16839
	Operating instructions VENTI*motion* FI; GR; RU	WM 16882
	Operating instructions VENTI*logic* DE	WM 66090
	Operating instructions VENTI*logic* FR; NL; IT	WM 66097
	Operating instructions VENTI*logic* GB	WM 66091
	Short operating instructions, VENTI*motion*/VENTI*logic* DE	WM 16833
	Short operating instructions, VENTI*motion*/VENTI*logic* GB	WM 16834
	Short operating instructions, VENTI*motion*/VENTI*logic* FR	WM 16835
	Service and repair guide VENTI*motion*/VENTI*logic* DE	WM 16831
	Service and repair guide VENTI*motion*/VENTI*logic* GB	WM 16832
	Service and repair guide VENTI*motion*/VENTI*logic* FR	WM 16866
	CD-ROM hospital manual for VENTI*motion*/VENTI*logic* including: – hospital manual DE – hospital manual GB – hospital manual FR – hospital manual IT – hospital manual NL	WM 24805 WM 16915 WM 16916 WM 16917 WM 16918 WM 16990
	Operating instructions VENTI-O_2, DE	WM 16849
	Operating instructions VENTI-O_2 FR; NL; IT	WM 16874
	Operating instructions VENTI-O_2 GB; ES; PL	WM 16875
	Operating instructions VENTI-O_2 DK; SE; NO	WM 16876
	Operating instructions VENTI-O_2 FI; GR; RU	WM 16889

8.2 Spare parts required for servicing

Set for changing patients

Set WM 15263

consisting of:

- 1 coarse dust filter
- 1 fine filter
- 2 silicone hoses, 2.5 x 1.25 SI NF, 200
- 2 silicone hoses 3/7 130
- 1 hose, pressure side
- 2 labyrinths
- 1 decoupling tube
- 1 motor frame
- 1 cushioning insert for fan box
- 1 fan box gasket
- 1 filter holder gasket
- 1 hose, intake side
- 1 foam for expansion space
- 1 foam for filter holder
- 1 device outlet, complete
- 2 countersunk screws ISO 7045-M4x6
- 1 control board, replacement
- 1 "reconditioned" label

Important!
The removed control board must be returned to Weinmann, otherwise you will be billed the full price!

Maintenance kit 5,000 hours or 2 years

Set WM 15684

consisting of:

- 1 coarse dust filter
- 1 fine filter
- 1 battery 3 V

Maintenance kit 10,000 operating hours or 4 years

Set WM 15679

consisting of:

- 1 coarse dust filter
- 1 fine filter
- 2 silicone hoses, 2.5 x 1.25 SI NF, 200
- 2 silicone hoses 3/7 130
- 1 hose, pressure side
- 2 labyrinths
- 1 decoupling tube
- 1 cushioning insert for box
- 1 fan box gasket
- 1 filter holder gasket
- 1 hose, intake side
- 1 foam for expansion space
- 1 foam for filter holder
- 1 device outlet, complete
- 2 countersunk screws ISO 7045-M4x6
- 1 motor frame
- 1 battery 3 V

9. Tools, test equipment and disinfectants

Below is a list of all the tools and test equipment mentioned in this service and repair guide.

The tools and test equipment required in detail can be found in the respective chapter.

9.1 Tools

- Phillips screwdriver size 1
- Phillips screwdriver size 2
- Slot-head screwdriver 0.5 x 3 x 100
- 11 mm Allen key adapter
- 2 mm Allen key
- 3 mm Allen key
- Knife with smooth, flat blade for loosening fascia film
- Nail scissors or punch to mark the service label

9.2 Test equipment and fixtures

- Manual pressure gauge,
  accuracy ± 0.25 %
  e.g. Digima premo SR
  type with pressure sensor **0–50 hPa**

  to order
  from Special Instruments
  Henkersgasse 2; 86720 Nördlingen,
  Germany
  Postfach 1451; 86714 Nördlingen,
  Germany
  Tel.: +49 9081/220-61 or -62,
  Fax: +49 9081/220 63.
- Torque wrench 20 – 120 Ncm

  to order from:
  Hoffmann GmbH
  Herbert-Ludwig-Straße 4
  D-28832 Achim, Germany
  Tel.: +49 4202/5 27-0
  Fax: +49 4202/5 27-15
- PC and PC software VENTI*support*
  WM 93340
- Test set WM 23465 incl. 23635 pressure measurement adapter
- 115 V power source, e.g. travel adapter 230 V/115 V, 200 W
- ESD protected work-station

- Flow measurement device

Flow and pressure gauge PF-300
to order from:
imtmedical ag
Gewerbestrasse 8
CH-9470 Buchs, Switzerland
Phone: +41 81 750 66 99
Fax: +41 81 750 66 95

www.imtmedical.com

or

Type RT 200 (Timeter)
to order from:
Allied Healthcare Products Inc.
1720 Sublette Avenue
St. Louis, Missouri, MO 63110
USA
Phone: 001-800-444-3954
Fax: 001-314-771-5183

or

Type EKU VIP ventilator tester
to order from:
EKU Elektronik GmbH
Feldstraße 9a
D-56291 Leiningen
Phone: +49 6746-1018
Fax: +49 6746-8484
www.eku-elektronik.de

or

Flow metering pipes
Rotameter 120 l/min, class 1.6 in operating mode (1013 hPa, 20 °C) with stand, hose liners, plug-in dial and titanium floats

to order from:
Yokogawa Deutschland GmbH
Broichhofstr. 7-11
D-40880 Ratingen
Phone: +49 2102-49 83-0
Fax: +49 2102-49 83-22
E-mail: info@de.yokogawa.com
http://www.yokogawa.com/de

9.3 Disinfectants

- TERRALIN
- MIKROZID LIQUID
- GIGASEPT FF

to order from:
Schülke & Mayr GmbH
Robert-Koch-Str. 2
D–22851 Norderstedt, Germany
Tel.: +49 40 / 52 100 - 0
Fax: +49 40 / 52 100 - 318
Internet: www.schuelkemayr.de

10. Technical data

	VENTI*motion*/VENTI*logic*	**VENTI*motion*/VENTI*logic* with VENTI*click***
Product class as per EC directive 93/42/EEC	IIa	
Dimensions WxHxD in cm	23 x 12.5 x 34	23 x 12.5 x 45.5
Weight	approx. 4.5 kg	approx. 4.8 kg
Temperature range – operation – storage	+5 °C to +35 °C –40 °C to +70 °C	
Air pressure range	750 – 1100 hPa (corresponds to a height of approx. 2500 metres)	
Max. respiration pressure at an air pressure of 600 hPa	25 hPa	
Electrical rating	115 – 230 V AC, 50–60 Hz Tolerance -20 % +10 %	
Power consumption during – operation – standby	**230 V** **115 V** 0.2 A 0.4 A 0.043 A 0.068 A	**230 V** **115 V** 0.35 A 0.7 A 0.043 A 0.068 A
Classification as per EN 60601-1 – type of protection against electric shock – degree of protection against electric shock	Protection class II Type B	
Electromagnetic compatibility (EMC) as per EN 60601-1-2: – radio interference suppression – radio interference immunity	EN 55011 EN 61000-3-2, EN 61000-3-3, EN 61000-4-2 to 6, EN61000-4-8 EN61000-4-11	
Mean sound pressure level/operation as per EN ISO 17510 at a distance of 1 m from the device in the patient position	approx. 35 dB (A) at 20-35 hPa approx. 31 dB (A) at 20 hPa approx. 29 dB (A) at 15 hPa approx. 27 dB (A) at 12 hPa approx. 25 dB (A) at 10 hPa approx. 23 dB (A) at 7 hPa	
Sound pressure level, alarm	approx. 62 dB (A)	
IPAP pressure range EPAP pressure range CPAP pressure range Pressure accuracy Increment	6 to 35 hPa 4 to 20 hPa 4 to 20 hPa ± 0.6 hPa 0.2 hPa (1 hPa = 1 mbar ≈ 1 cm H_2O)	
Minimum stable limit pressure (PLS_{min}) (min. pressure in the event of a fault) Maximum stable limit pressure (PLS_{max}) (max. pressure in the event of a fault)	≥ 0 hPa ≤ 60 hPa	
Respiratory frequency Accuracy Increment	6 to 45 l/min ± 0.5 l/min 1 l/min	

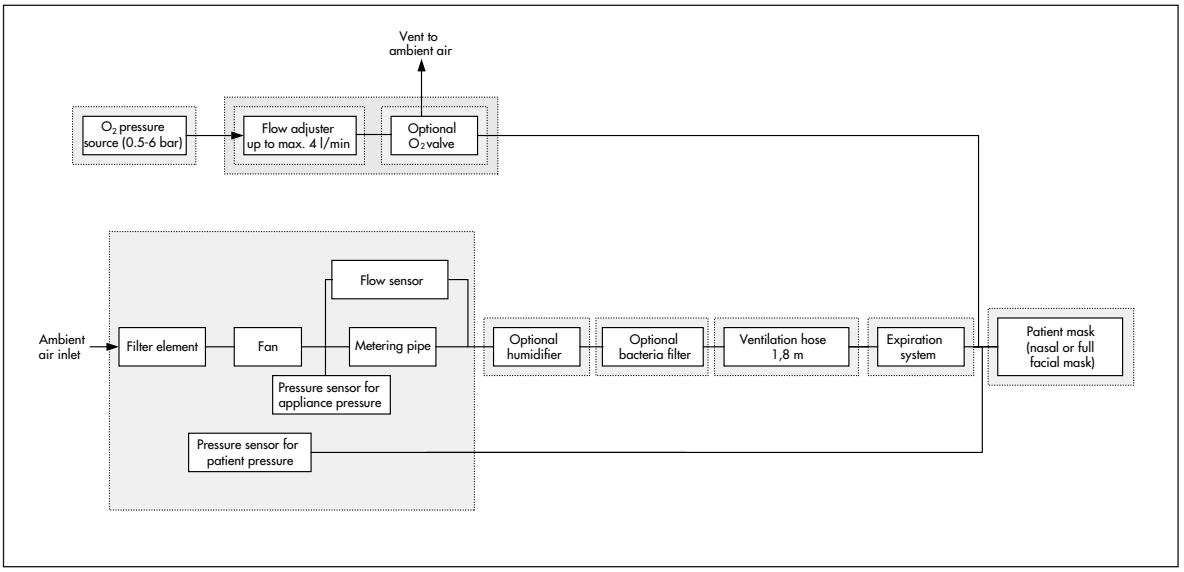
	VENTI*motion*/VENTI*logic*	**VENTI*motion*/VENTI*logic* with VENTI*click***
I:E (Ti/T): Inspiration time Increment Accuracy	20 % to 67 % of respiratory period 1 % ±1 %	
Trigger level	can be adjusted in 6 levels, separately for inspiration and expiration; in ST mode, expiration trigger can be switched off	
Speed of pressure rise	adjustable in 6 levels	
Speed of pressure drop	adjustable in 6 levels	
Accuracy of volume measurement	at 23 °C: ± 15 %	
Flow at max. speed at: 0 hPa Tolerance	300 l/min. ±15 l/min.	275 l/min. ±15 l/min.
Flow at max. speed with bacteria filter at: 0 hPa Tolerance	270 l/min. ±15 l/min.	250 l/min. ±15 l/min.
Heating of respiratory air as per HMV	2.5 °C	depending on heating level
Pressure constant measured to DIN EN ISO 17510 in CPAP mode	at 20 hPa: $\Delta p \leq 1$ hPa at 14 hPa: $\Delta p \leq 1$ hPa at 10 hPa: $\Delta p \leq 1$ hPa at 7 hPa: $\Delta p \leq 0.5$ hPa	
Fine filter separation level up to 2 µm	≥ 99.7 %	
Fine filter service life	1000 hours assuming normal ambient air	
Permitted humidity in operation and storage	≤ 95 % rh (no condensate formed)	
System resistance at an air flow of 60 l/min at patient connection opening	VENTI*motion* with hose system WM 24130 and Silentflow WM 23600	VENTI*motion* with O_2 hose system WM 23737, VENTI*click* WM 24365 and bacteria filter WM 24148
	$0.19 \frac{kPa \cdot s}{l}$	$0.29 \frac{kPa \cdot s}{l}$

All values determined under ATPD conditions (ambient temperature and pressure, dry).

The right to make design modifications is reserved.

CE 0197

10.1 Diagram of pneumatic system



10.2 Safety distances

Recommended safety distances between portable and mobile HF telecommunications equipment (e.g. mobile phones) and the therapy device			
Rated output of HF device in W	**Safe distance as a function of transmission frequency in m**		
	150 KHz - 80 MHz	**80 MHz – 800 MHz**	**800 MHz – 2.5 GHz**
0.01	0.12	0.12	0.24
0.1	0.37	0.37	0.74
1	1.17	1.17	2.34
10	3.69	3.69	7.38
100	11.67	11.67	23.33

Further technical data are obtainable from the manufacturer, WEINMANN, on request.

The right to make design modifications is reserved.

11. Technical amendments

Technical amendment	From device no.	Date

12. Protocols

12.1 Repair and service protocol

Device master data	**Maintenance and repairs carried out as per service records**			
Manufacturer: Weinmann GmbH + Co. 22525 Hamburg	**Total operating hours**	**Comparative measurement (hPa) as per patient record**	Measures/Comments	Maintenance carried out as per VENTI*motion*/VENTI*logic* service guide
Device type: ☐ **VENTI*motion*** ☐ **VENTI*logic***				Company _____ Date _____ Signature
IPAP as per patient record: _____hPa EPAP as per patient record: _____hPa Frequency f: _____l/min Initial Softstart pressure: _____hPa Softstart time: _____ Speed of pressure rise, insp. _____ Speed of pressure rise, exp. _____ Humidifier stage: _____ Mode: _____ Device no.: _____ Inspiration trigger: _____ Expiration trigger: _____ Target values: T_{T1} _____ ΔT_{T2} _____ T_{T3} _____ Owner/operator: _____ _____				Company _____ Date _____ Signature
				Company _____ Date _____ Signature
				Company _____ Date _____ Signature

12.2 Test protocol

Test protocol Ventimotion/Ventilogic WEINMANN

Device: ☐ VENTI*motion* **WM 24810**
☐ VENTI*logic* **WM 27005** **Device no.:** ..... **Device no.:** ..... **Software version:** .....

1. Test equipment
- as per service and repair instructions for Ventimotion WM 16832

2. Preparation for testing
- as per service and repair instructions for Ventimotion WM 16832

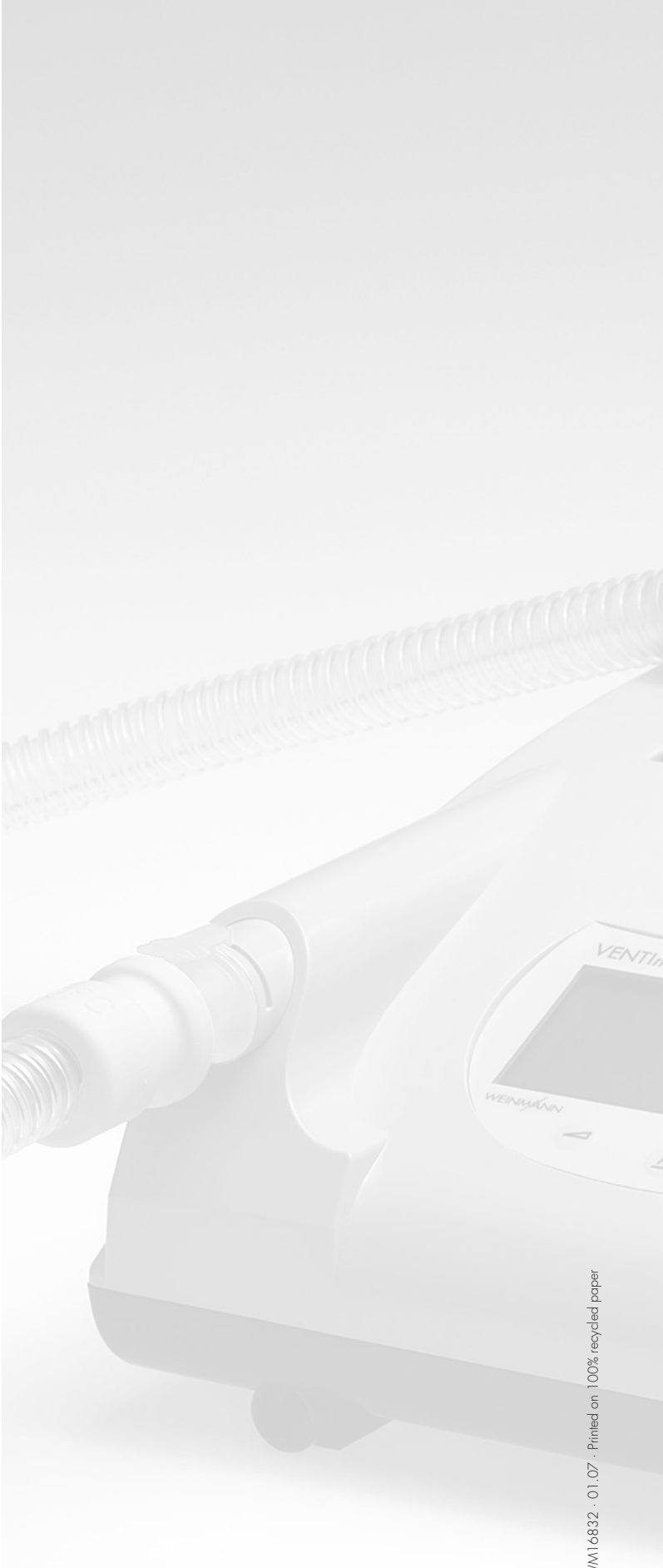
3. Enter device data*	**Measured value**	**OK**	**not OK**
4. Test for correctness of temperature calibration and calibration status*			
5. Test of battery voltage • Battery voltage is ≥ 2,9 V, not service key sign shown on display		☐	☐
6. Test of interface to VENTI*click* • VENTI*click* is working correctly		☐	☐
7. Check target pressure values at 5, 20, and 35 hPa • The difference between target value and measured value at test bench: target value ± 0,5 hPa mask pressure: target value ± 0,5 hPa		☐	☐
8. Test of flow measurement • Flow is 50 ± 10 l/min • Flow is 100 ± 12 l/min	☐ l/min ☐ l/min	☐ ☐	☐ ☐
9. Leak test • measured pressure is ≥ 35 hPa	☐ hPa	☐	☐
10. Test of clock function • clock is working correctly		☐	☐
11. Test of interface to VENTI-O_2 • interface is working correctly		☐	☐
12. Test of interface to VENTI*power* • interface is working correctly		☐	☐
13. Noise test*			
14. Test of all keys, encoder and 115 V mode • device is working correctly with 115 V power supply • keys are detected correctly • encoder is working correctly		☐ ☐ ☐	☐ ☐ ☐
15. Test of display including backlight and contrast, LEDs and alarm • LEDs light up correctly • display segments light up correctly, backlight is working correctly • contrast is set correctly • the alarm generates the correct alarm sound sequence and can be heard without distortion		☐ ☐ ☐ ☐	☐ ☐ ☐ ☐
16. Check of maintenance sticker • maintenance sticker data updated and applied correctly	present ☐ yes ☐ no	☐	☐

Targetvalue	**Test bench**	**Mask**	
5 hPa			hPa
20 hPa			hPa
35 hPa			hPa

Maintenance performed: yes ☐ no ☐ Final test carried out: _____ (date) _____ (name)

* test points only feasable with Weinmann test bench

For decades Weinmann has been developing, producing and marketing medical devices for markets around the world. In cooperation with our partners we design economic health systems for diagnosis and therapy in Sleep Medicine, Home Mechanical Ventilation, Oxygen Medicine and Emergency Medicine.



WEINMANN

Weinmann
Geräte für Medizin GmbH + Co. KG
P.O. Box 540268 · D-22502 Hamburg
Phone +49/40/5 47 02-0
Fax +49/40/5 47 02-461
E-mail int.sales@weinmann.de
Internet www.weinmann.de

WW16832 · 01.07 · Printed on 100% recycled paper